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EARTH OBSERVING SYSTEM
DATA AND INFORMATION SYSTEM (EOSDIS)
TEST SYSTEM (ETS)
LOW-RATE SYSTEM (LRS)
TPCE USER'S GUIDE

Volume 2

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National Aeronautics and
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Greenbelt, Maryland

Earth Observing System
Data and Information System (EOSDIS)
Test System (ETS) Low-rate System (ETS LRS)
Telemetry Processing Control Environment (TPCE) User's Guide
Volume 2

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Preface

Volume 1, Hardware Environment, contains system configuration and system-level processing information for the ETS LRS, developed by the Microelectronic Systems Branch, Code 521, NASA/Goddard Space Flight Center (GSFC). Volume 1 explains how the system operates, the functions it performs, appropriate applications, and installation/operational procedures.

This document, Volume 2 , describes the ETS LRS Telemetry Processing Control Environment (TPCE), and how to use TPCE to monitor and control telemetry processing sessions.

User should pay attention to Section 11 - System Constraints before reactivating TPCE or editing configuration sets.

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Change Information Page

List of Effective Pages	
Page Number	**Issue**
Title	Original
Signature Page	Original
iii thru viii	Original
1-1	Original
2-1 thru 2-7	Original
3-1 thru 3-4	Original
4-1 thru 4-4	Original
5-1 thru 5-17	Original
6-1 thru 6-3	Original
7-1 thru 7-5	Original
8-1 thru 8-21	Original
9-1 thru 9-8	Original
10-1 thru 10-5	Original
11-1 thru 11-3	Original
AB-1	Original

Document History		
Issue	**Date**	**DCN No.**
Original	May 1997	N/A

Table of Contents

Introduction
1

This document describes the ETS LRS telemetry processing control environment (TPCE), and how to use TPCE to monitor and control telemetry processing sessions.

TPCE allows an operator to set up the ETS LRS, flow data through the system, and monitor system status from a remote (or local) location that is connected through Ethernet. TPCE runs on an HP-755 workstation using X-windows.

TPCE receives and sends setup, status, and data through the Master Controller of the ETS LRS. Information is passed between the two systems packed in Modular Environment for Data Systems (MEDS) messages, which provide the translation of information in a format that ETS LRS can process and produce. TPCE translates input from the ETS LRS, and creates displays and updates screens accordingly. It also receives commands and data from the operator, and transfers that information to the ETS LRS.

TPCE is a menu-driven window system. Multiple windows can be open, which provides the operator with a versatile and efficient method to access information, monitor status, and perform tasks. Windows may be opened/closed as needed, screen positions may be changed, and screens may be closed into icons.

Using TPCE to control the ETS LRS will allow the operator to:

- Establish a connection between a TPCE workstation and the ETS LRS (MEDS-based system). TPCE provides a list of all available MEDS-based systems and whether TPCE is connected to each system. From this list, the operator may connect or disconnect to the ETS LRS.

- Load a previously edited catalog. A new catalog can also be created. TPCE allows MEDS catalogs to be created, deleted, modified, and saved. Once a catalog is created, it is maintained in a hierarchical directory, which the operator accesses to manipulate catalogs.

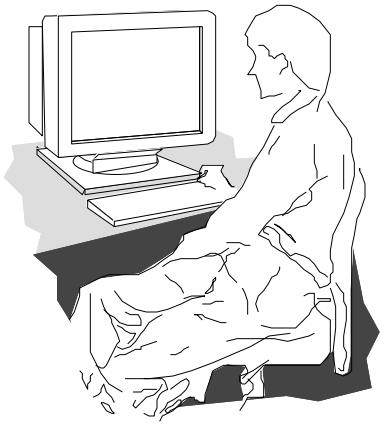
- Enable the ETS LRS in preparation for a processing session.

- Access status screens and monitor telemetry processing. Status collection can be automatic, or in response to a command sent by the operator.

- End the processing session. Two TPCE commands are used to end an acquisition session: **Flush** releases any residual data from subsystem buffers, and **Disable** turns off data flow and processing. These commands can be initiated automatically by detection of a timeout condition.

- Manage data set distribution by issuing data set transfer commands to the Versa Module Eurocard (VME) system based on a request table, and data set ready events received from the VME system.

Getting Started
2



This section provides basic instructions for the graphical user interface used in the Control Workstation environment. It describes general interactions such as using the mouse and keyboard, and manipulating graphical objects. The explanations of user interface semantics may change based on changes in requirements for a specific application's operation.

2.1 Mouse and Cursor

The mouse is used to point at and select graphical objects on the screen. The position of the mouse is indicated by a cursor, normally in the shape of an arrow, which moves about the screen as the mouse is moved on the positioning pad. While using the system, the cursor may change into an object other than the standard arrow (i.e., an hourglass) when a particular function is performed. This indicates a change in the normal actions that result from moving or selecting. Generally, when the activity is completed, the cursor will revert to an arrow. Examples of cursors used in the system are as follows:

Arrow
Used to select buttons, icons, menus, and other graphical objects.

Watch
Indicates that system is executing an operation and no mouse or keyboard input will be accepted until it is completed.

Text Entry
Indicates when keyboard input is expected.

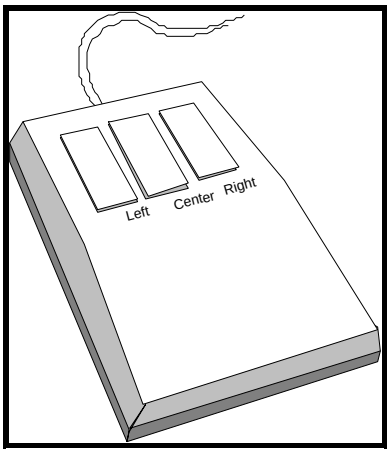
X-window System
Used to interact with applications other than the control environment that may be running (e.g., HP VUE Workbench).

Crosshair
Used to resize windows (where available).

Three basic actions are associated with using a mouse:

- Clicking or selecting: positioning the cursor over the object of interest and pushing and releasing one of the buttons on the optical mouse.
- Holding down: pressing a mouse button without releasing it.
- Dragging: moving the mouse while holding down a mouse button.

In this User's Guide, mouse buttons are referred to individually as Left, Right, and Middle Buttons. The Left Button is the left-most button on the optical mouse; the Middle Button is the center button; and the Right Button is the right-most button, as shown in the following example:



The mouse and keyboard are used to direct operation of the system. Although the mouse has three buttons, the system relies primarily on the Left Button. If a particular button is not noted, the Left Button is used.

2.2 Select an Icon

An icon is a user-selectable, graphical representation of a function or window, as shown in the following example:

1 Position the mouse cursor over the icon.

2 Click the **Left Button**.

When selected, an icon appears to be highlighted.

2.3 Select and Edit Text

A text key-in is a single-line, user text entry field. A label is displayed to the left of the rectangular area surrounding the text entry field.

1 Position the mouse cursor in the text entry field where the modification to be made begins.

The cursor changes to a text entry cursor.

2 Hold down the **Left Button** and drag the mouse to the end of the modification.

The selected text highlights.

3 Release the mouse and enter new text.

The previous text disappears and new text appears.

2.4 Buttons

A button is a 3-dimensional rectangle surrounding text. To perform an action, click on the button.

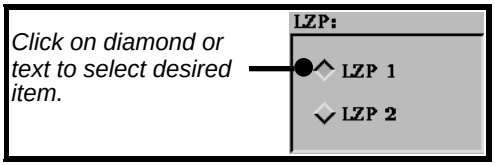
1 Position the mouse cursor over the button.

2 Click the **Left Button**.

The button appears to press down.

2.5 Radio Buttons

A radio button is a labeled set of selections with a small diamond to the left of each choice. Only one value in a radio button may be selected at a time. The currently selected value is represented by a diamond that appears pressed (pushed in).



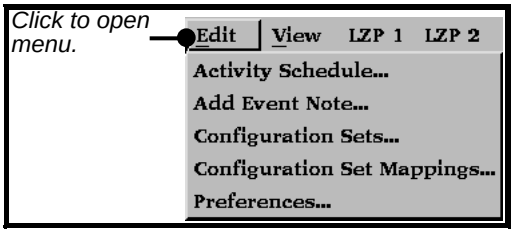
1 Position the mouse cursor over the text, or the diamond next to text, of the desired selection.

2 Click the **Left Button**.

The diamond becomes pressed.

2.6 Pulldown Menus

A pulldown menu displays a set of options or a set of commands—only one option or command may be selected at a time.



1 Position the mouse cursor over the pulldown menu.

2 Click and hold down the **Left Button**.

3 Drag the mouse to the desired selection.

The selection is highlighted when the cursor is positioned over it.

4 Release the **Left Button**.

The action associated with the menu item is performed.

2.7 Option Menus

An option menu displays a set of options; it is similar to a radio button in operation and appearance. However, it is labeled with the current selection followed by a dash mark that designates it as an option menu, and not a button. When selected, an option menu displays a menu of text choices.

1 Position the mouse cursor over the option menu.

2 Click and hold down the **Left Butto**n.

3 Drag the mouse to the desired selection.

The choice is highlighted when the cursor is positioned over it.

4 Release the **Left Button**.

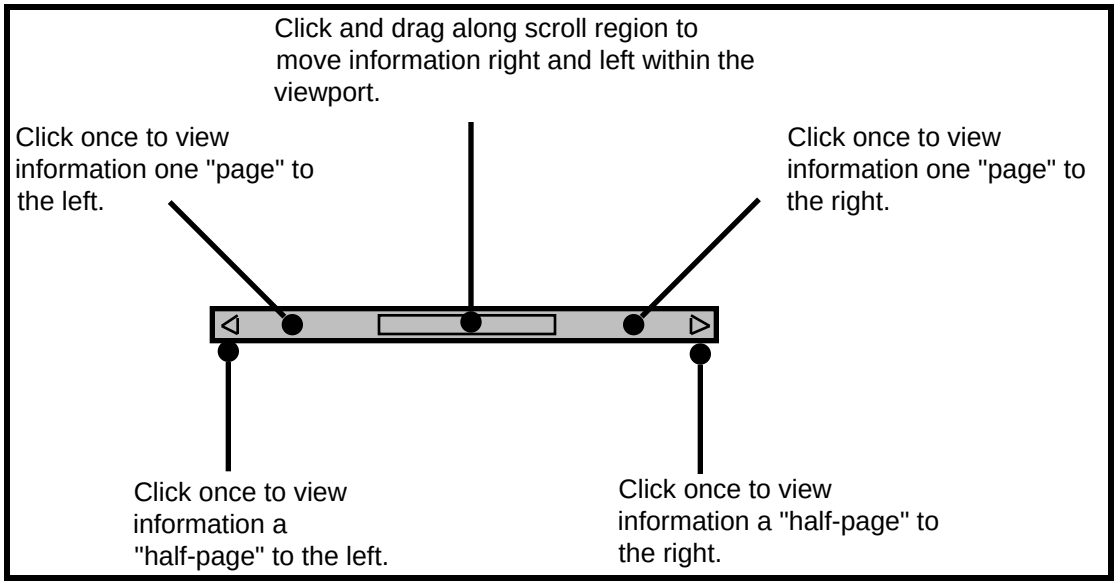
The option menu label displays the new selection.

2.8 Scrollbars

A scrollbar is an object that allows the user to view a large window within a smaller window called a viewport. A scrollbar consists of three components: scroll arrows, scroll region, and scroll box. The scroll box changes size depending on the percentage of information visible in the viewport. If all information is visible, the box occupies the entire scroll region. The following scrollbox is for a viewport smaller than the information to be shown. Scrollbars may be oriented vertically, or horizontally (as shown).

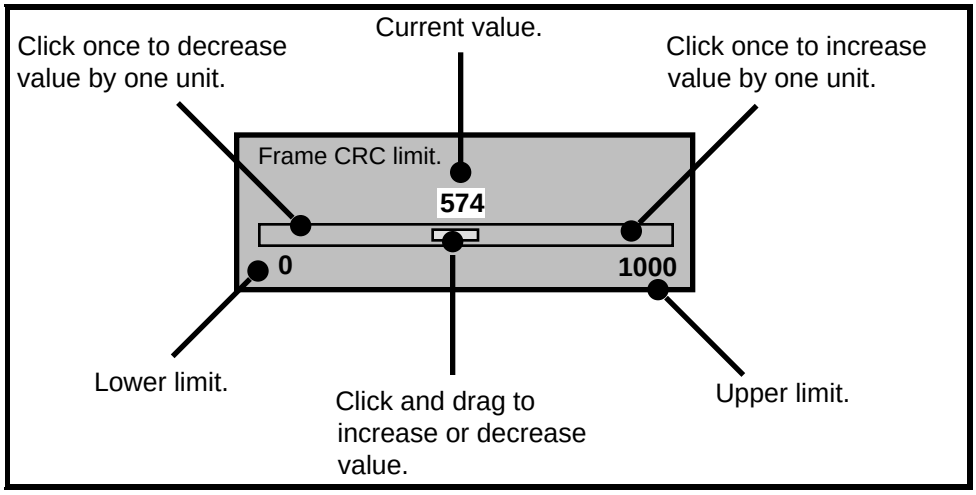
1 Position the mouse cursor over the scrollbar.

2 Use the **Left Button** to control scrolling operations.



2.9 Sliders

A slider is an object that modifies a value. Manipulating a slider increases/decreases a value depending on the direction in which it is moved. A slider consists of two components: slider region and slider box.

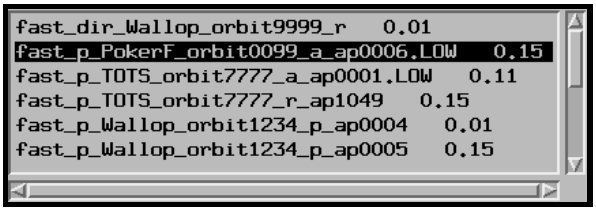


1 Position the mouse cursor over the slider.

2 Use the **Left Button** to modify the value.

2.10 Select a Single Value from a Scrolling List

A single selection scrolling list contains a number of values from which the user can select only one entry.



1 Position the mouse cursor over the entry desired in the scrolling list.

2 Click the **Left Butto**n.

The selected entry is highlighted when the mouse is released.

2.11 Select Multiple Values from a Scrolling List

A multiple selection scrolling list contains a number of values from which the user can select one or more entries. Not all scrolling lists allow multiple selections. Selecting items in a multiple selection list is similar to single-selection lists. However, the keyboard Shift key is used to extend the current selection with additional items.

1 Position the mouse cursor over the first desired item in the scrolling list.

2 Click the **Left Button**.

The entry is highlighted when the mouse is released.

3 To select additional items, position the mouse cursor over the next desired item in the scrolling list.

4 Hold down the keyboard **Shift** key and click the **Left Button**.

The original item and the new item are highlighted.

5 Repeat steps 3 and 4 until all desired items are highlighted.

6 To unselect an item: repeat steps 3 and 4, but click on the already highlighted item.

The entry becomes unhighlighted when the mouse is released.

2.12 Enter a Time

A number of time entry objects can be found throughout the system. The user can modify each component by using the up or down arrows, or by entering a new value.

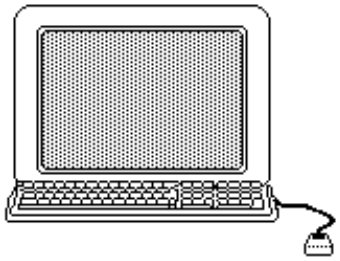
1 Position the mouse cursor over a date/time component (year, day of year, hour, minute, or second).

2 Click the **Left Button**.

The date/time component is highlighted when the mouse is released.

3 Click the **Arrow** buttons to increase/decrease the highlighted component, or enter a new value.

Using the ETS LRS
3



The ETS LRS control environment provides tools for controlling and monitoring operation of the Very Large Scale Integration (VLSI) Low-rate System, and managing the distribution of telemetry data to user sites.

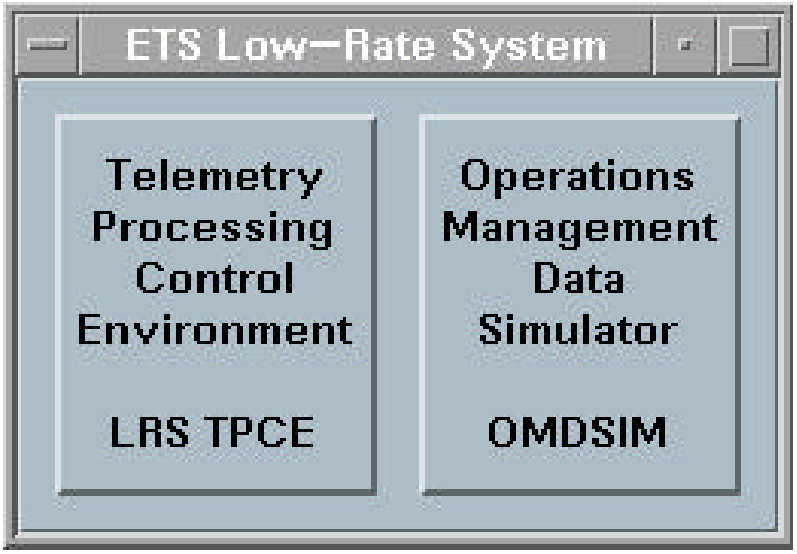
3.1 ETS LRS Main Window

Perform the following steps to bring up ETS LRS software environment:

a. At the HP workstation login window, enter the proper user id. and password. Upon successfully loging in, an HP menu bar appears at the bottom of the monitor screen.

b. Open a terminal window by clicking on Terminal Icon on the HP menu bar or selecting X-Term from **Utilities** folder in the **General Toolbox** at the right hand corner of HP menu bar.

c. Enter the **ETS LRS** command in the open terminal window. The following window should appear.

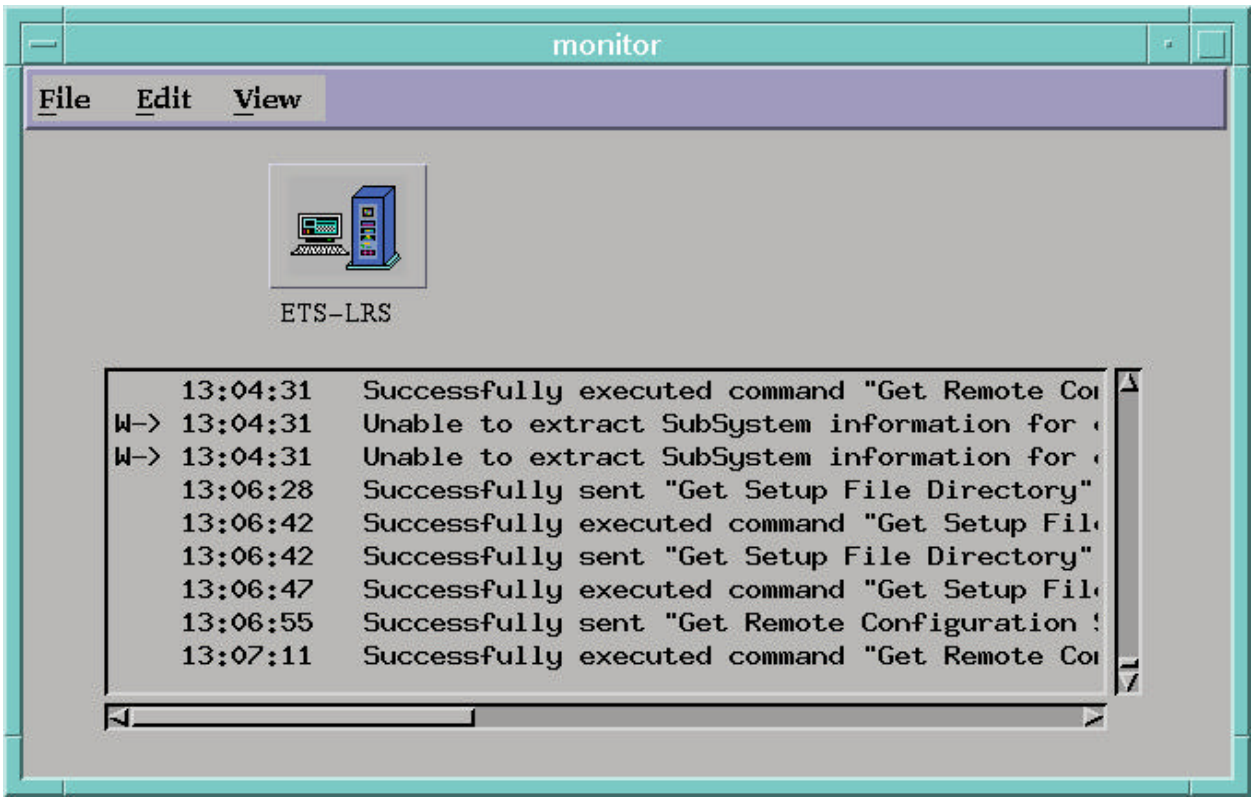


d. Double click on LRS TPCE to bring up LRS Main TPCE window.

e. Double click on OMDSIM to bring up Operations Management Data Simulator (OMDSIM) main window.

3.2 ETS LRS Main TPCE Window

The Monitor window is the main TPCE window for ETS LRS. This window provides an indication of the overall status of the system's primary components. Users can view/modify the most recent event log file, access the controlling functions of the ETS LRS, and access status displays.


monitor
File
Edit
View
ETS-LRS
13:04:31 Successfully executed command "Get Remote Co
W-> 13:04:31 Unable to extract SubSystem information for
W-> 13:04:31 Unable to extract SubSystem information for
13:06:28 Successfully sent "Get Setup File Directory"
13:06:42 Successfully executed command "Get Setup Fil
13:06:42 Successfully sent "Get Setup File Directory"
13:06:47 Successfully executed command "Get Setup Fil
13:06:55 Successfully sent "Get Remote Configuration
13:07:11 Successfully executed command "Get Remote Co

3.3 Control and Monitor Operations

The Menu list in the Monitor window is used to initiate ETS LRS command and monitoring functions. The File menu contains items for event log operations and exiting the ETS LRS. The Edit menu contains items for changing/viewing the activity schedule, annotating the event log, and modifying configuration and preferences, and selecting the desired message filter. The View menu contains items for viewing old event logs and displaying the list of data sets being distributed. The ETS LRS menu pops up upon clicking on the ETS LRS icon on the Monitor window. The ETS LRS menu contains selections for performing manual system commanding, and viewing overall session, processing, and subsystem status.

3.4 System Component Status Display

VLSI-LRS general status is indicated by the color (or lack of color) surrounding the components icon in the Monitor window. A color represents the collective status of the Simulator, Front-End Processor (FEP), and Service Processor Cards of the VLSI-LRS. Status colors are:

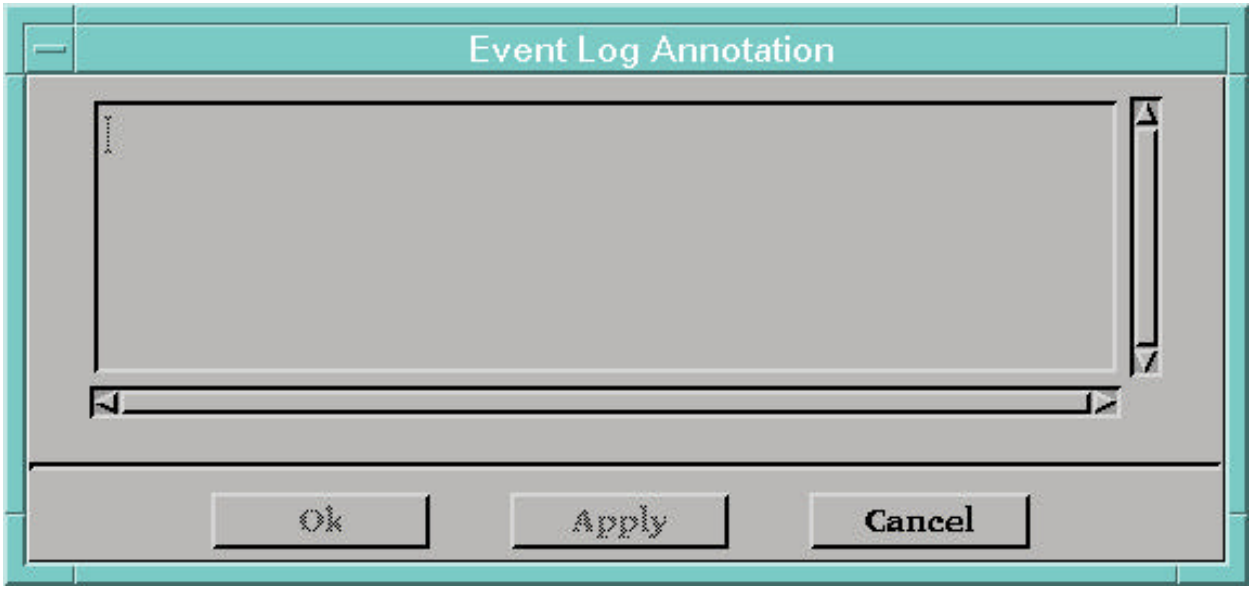
- None: all VLSI-LRS cards are functioning properly.
- Yellow: a VLSI-LRS card is booting.
- Red: a VLSI-LRS card is not functioning properly. Communication with the VLSI-LRS is not possible.

NOTE: Commanding a VLSI-LRS is not possible when the status color is yellow or red.

3.5 Event Log Display

The event log contains messages pertaining to ETS LRS operation. These messages are generated automatically from the ETS LRS software. The messages can also be generated manually by operators of the ETS LRS (refer to Section Chapter 7, Working with the Event Log). The information displayed in the Monitor window's scrolling list is the current event log information.

When the event log reaches a predetermined maximum file size, the log is closed and a new event log is created. The naming convention of event log files is based on the start and end times for opening and closing the event log.



3.6 Log in to the ETS LRS

To use the ETS LRS system, the user must first log into the Control Workstation. Contact a System Administrator for account setup, user name, and password. To log in, enter the assigned user name and password, and perform the following:

1 Change directory to login account where TPCE is located. For example, if you login as cmtpce, enter **cd /ets1/users/cmtpce/run** at the terminal prompt to change to the operating directory.

2 Set environment variables that you would want to bring up TPCE.

3 Start TPCE, (e.g., enter **./start** at the terminal prompt.)

This sets up and initiates the workstation software. The ETS LRS system will take several minutes to start up. The Monitor window appears after the initialization is complete.

3.7 Exit the ETS LRS

Except in unusual circumstances, there is no need to exit the ETS LRS system. If it is necessary to exit, first close all open ETS LRS windows in order to prevent accidental loss of data.

1 Select **Exit** from the **File** menu in the Monitor window.

A confirmation window is displayed.

2 Click the **Button** to shut down the ETS LRS.

The ETS LRS application quits.

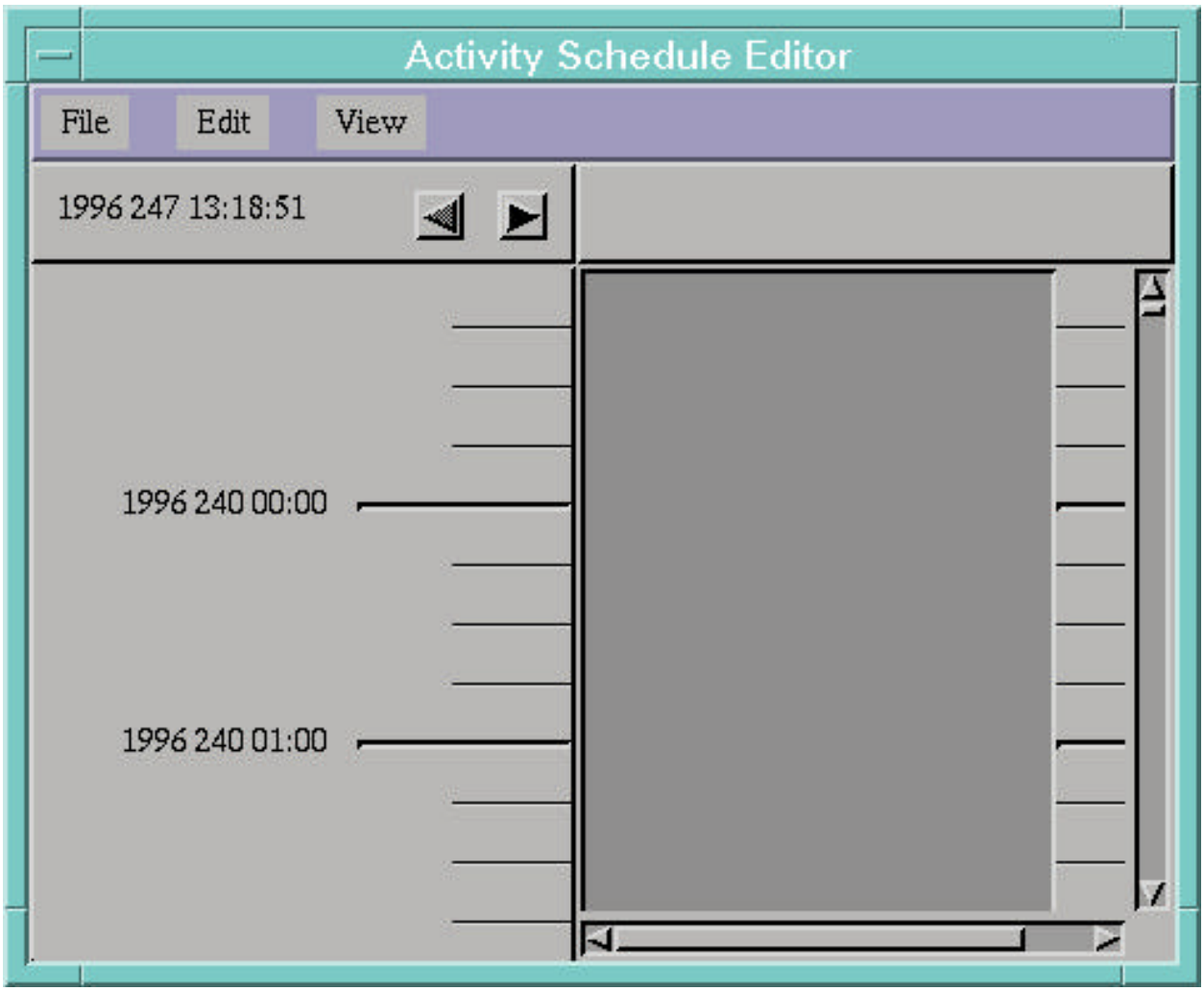
Activity Schedule
4

The section provides basic instructions on how to view and edit the schedule of sessions planned.

4.1 View the Activity Schedule

The Activity Schedule window provides access to 10 days of the schedule, divided into 2 blocks of 5 days. Use the scrollbar to move the view within the current 5-day period. Use the arrow buttons to move back and forth between the two periods. Sessions are displayed as blocks of time. Session start/stop times are noted by the beginning and ending of the block, respectively, on the time scale. The session groundstation is indicated by a label on the block.

To view the Activity Schedule, select **Activity Schedule...** from the Edit menu in the Monitor window.



4.2 View Current Time

If the current time (indicated by the arrowhead ▶) is not in view, it can be automatically scrolled into view. Select **Current Time** from the View menu in the Activity Schedule window.

If the current time (indicated by the arrow head) is not in view, it is necessary to update current date and time in the following file.

a. Change to **Schedules** directory by opening up a terminal window and enter a Unix command. For example, if you are running in an environment of test team, enter the following command:

cd users/combotst/build7/scr/tpce/data/schedules/

b. Use a text editor tool (e.g., vi) to edit the file "**aScratchSchedule**"

c. Modify the first line of this file to reflect current date and time. For example, entering the following format for January 29, 1997 7:30 am

	Year	Day	Hour	Minute	Second
first line of file should read	1997	29	00	00	00

Note: The time shown in the activity scheduler is Greenwich Mean Time (GMT) a world wide standard. There is about a four hour difference between time at the Goddard Space Flight Center (GFSC) and GMT.

d. Save the newly revised information.

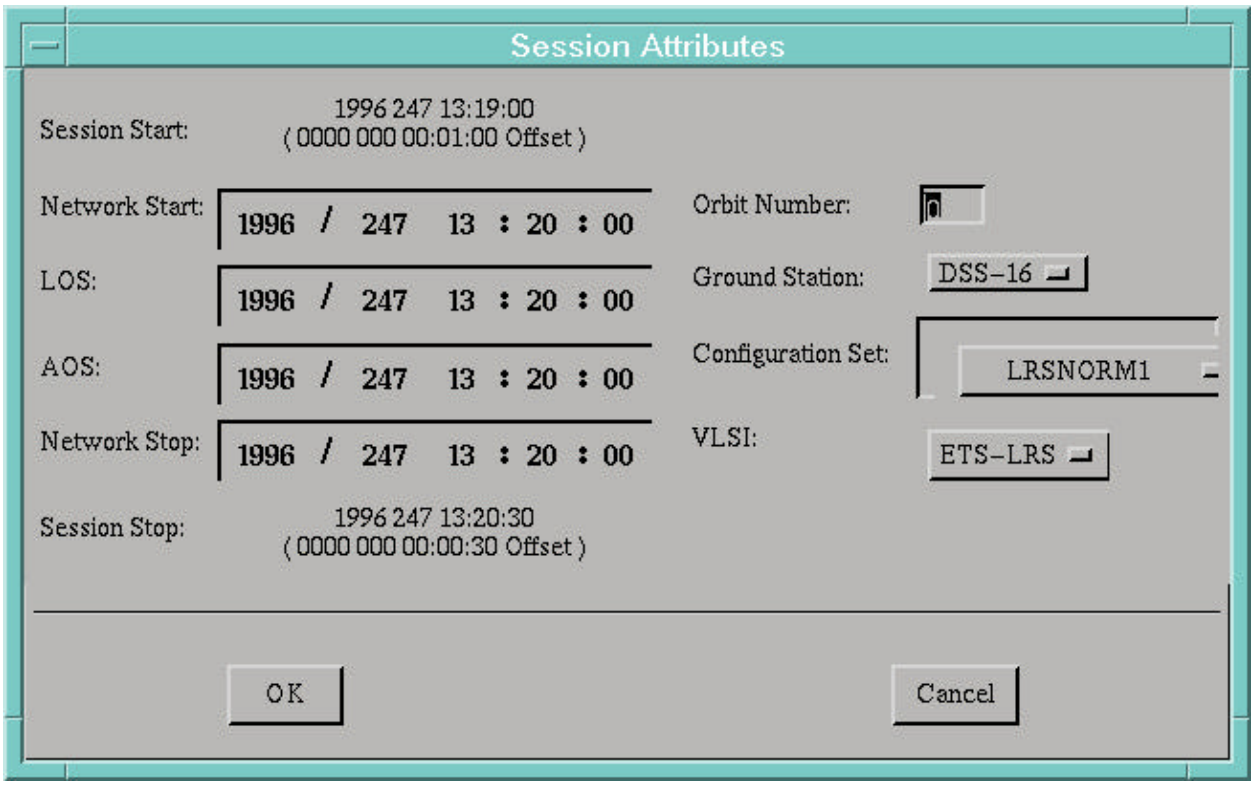
4.3 View Session Attributes

To view detailed session information, in addition to the summary information displayed in the Activity Schedule window, perform the following:

1 Select the desired session in the Activity Schedule window.

2 Select **Session Info...** from the View menu.

Detailed information for the selected session is displayed.



4.4 Add a Session Event

To add a new session to the schedule, perform the following:

1 Select **New Session...** from the Edit menu in the **Activity Schedule Editor** window.

2 Enter/set all session attributes: Network Start, Acquisition of Signal (AOS), Loss of Signal (LOS), Network Stop, Orbit Number, Groundstation, Configuration Set, VLSI-LRS.

3 Click **OK** to add the session event and save the schedule.

The new session appears in the Activity Schedule window and the activity schedule is saved.

NOTE:

1. A session even may not be added or moved on top of any part of an existing event in the schedule. If a *Start* and/or *Stop* time that overlaps another event is set, the system will alert the user of the overlap and the event will not be added or moved. The Session Attributes window will remain open so that settings may be modified. Modify the Start, AOS, LOS, and/or Stop times to position the session where it will not overlap another, or click on the **Cancel** button to cancel the addition or modification.

2. When system detects the **Orbit Number** on the new schedule is smaller than an Orbit Number that is in one of previously saved sessions, it will pop up a window alerting that a conflict has been detected. You can do either one of following procedures:

   a. Enter a larger Orbit Number, or

   b. Change directory to the following directory by opening up a terminal window and enter a Unix command. If you are running in an environment of test team, enter the following commands:

cd users/combotst/build7/scr/tpce/data/schedules/

cp `emptySchedule aScratchSchedule` (copy an empty schedule to **aScratchSchedule** file)

Modify the first line of file "**aScratchSchedule**" per steps in section 4.2 to update current date and time.

4.5 Modify a Session Event

To modify a session in the schedule, perform the following:

1 Select the desired session in the Activity Schedule window.

2 Select **Modify Session...** from the Edit menu.

3 Modify session information as needed.

4 Click **OK** to add the session event and save the schedule.

The session updates in the Activity Schedule window and the activity schedule is saved.

4.6 Delete a Session Event

To delete a session from the schedule, perform the following:

1 Select the desired session (in future) in the Activity Schedule window.

2 Select **Delete Session...** from the Edit menu.

A confirmation window is displayed.

3 Click **OK** to delete the selected session and save the schedule.

The session is deleted from the Activity Schedule and the activity schedule is saved.

Configuration Set Editor

5

The section provides basic instructions on how to examine and/or modify the parameter values in an existing configuration set, or to define a new configuration set.

5.1 Display Configuration Set Editor Window

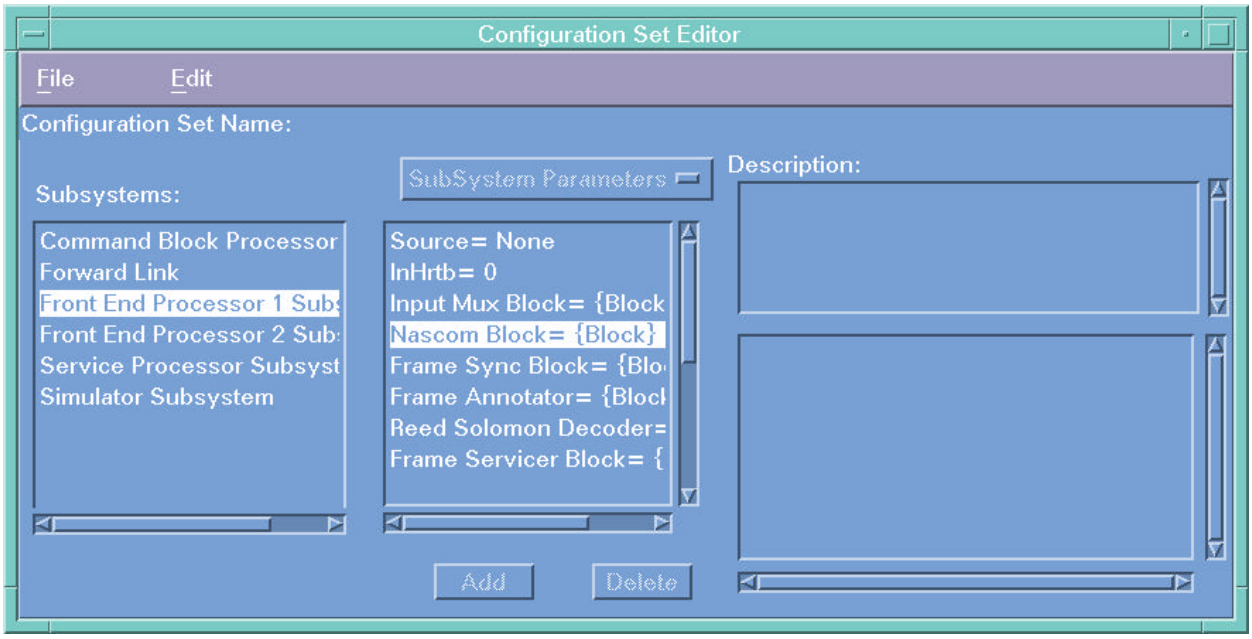
A configuration set is a data file that contains telemetry processing setup parameters used to initialize the VLSI-LRS for a session. A configuration set consists of one or more setup blocks, each corresponding to a VLSI-LRS subsystem. Each setup block contains a group of parameters and associated values. To display the Configuration Set Editor window, select **Configuration Sets...** from the Edit menu in the Monitor window.

5.2 Create a New Configuration Set

To create a new set of telemetry processing parameters using the Configuration Set Editor, select **New...** from the **File** menu. If an open configuration set with unsaved changes exists, the user will be prompted to save those changes (refer to Section 5.11, Save Changes to a Configuration Set).

An untitled configuration set is created, which contains all available subsystems. These subsystems appear in the **Subsystems** list.

Select the card to be configured from the **Subsystems** list (e.g., Front End Processor 1). The associated parameters for the selected (highlighted) card will appear on the Configuration Set Editor for editing.



5.3 Edit Existing Configuration Set

To modify the telemetry processing parameters in an existing Configuration Set, perform the following:

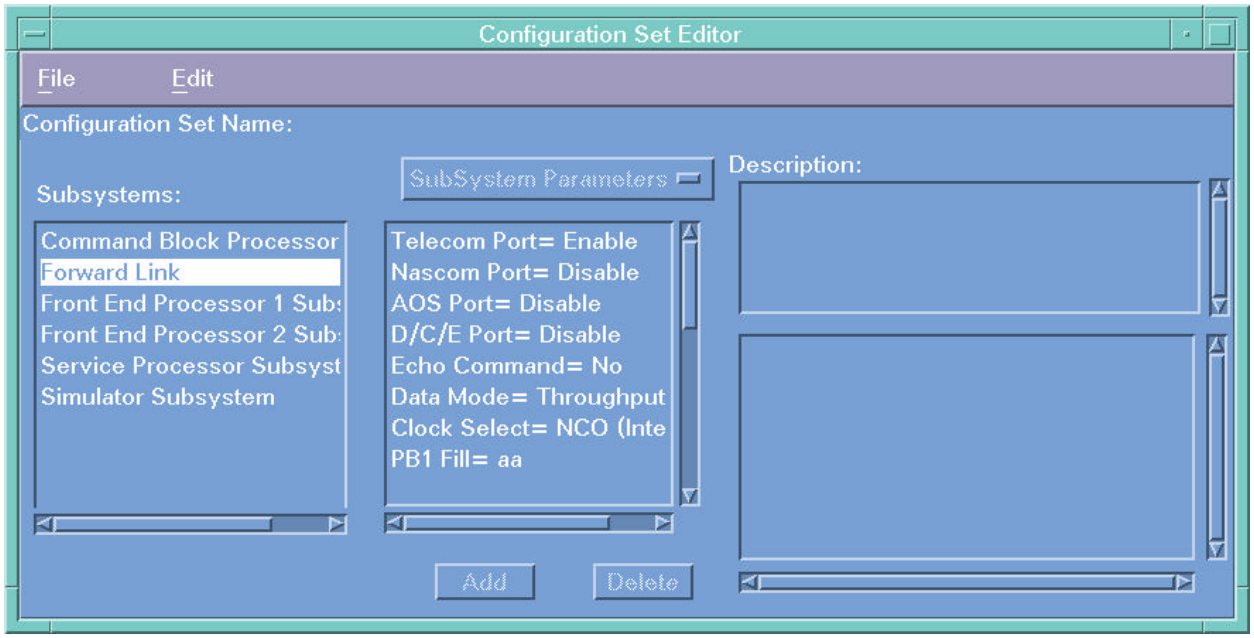
1 Select **Open...** from the File menu in the **Configuration Set Editor** window. If an open configuration set with unsaved changes exists, the user will be prompted to save the changes (refer to Section 5.11, Save Changes to a Configuration Set).

A listing of the available configuration sets is displayed.

2 Select the configuration set to be opened.

3 Highlight the Forward Link subsystem to show the associated parameters for configuring forward link card.

4. Double click on a parameter, a subwindow is displayed. Enter appropriate value(s) associated with that parameter.



5.4 View Subsystem Parameters

Each subsystem in the configuration set contains a list of parameters with associated values for the parameters. To examine a subsystem's parameters and associated values, perform the following:

1 Select the desired subsystem from the **Subsystems** list (e.g., Command Block Processor).

The list of parameters appears in the Subsystem Parameters list.

2 Select a parameter and view its description.

The parameter's description appears in the Description field.

5.5 Retrieve Remote Configuration Set

The Retrieve Remote Configuration Set command allows user to get catalogs previously defined and stored on the VME local disc.

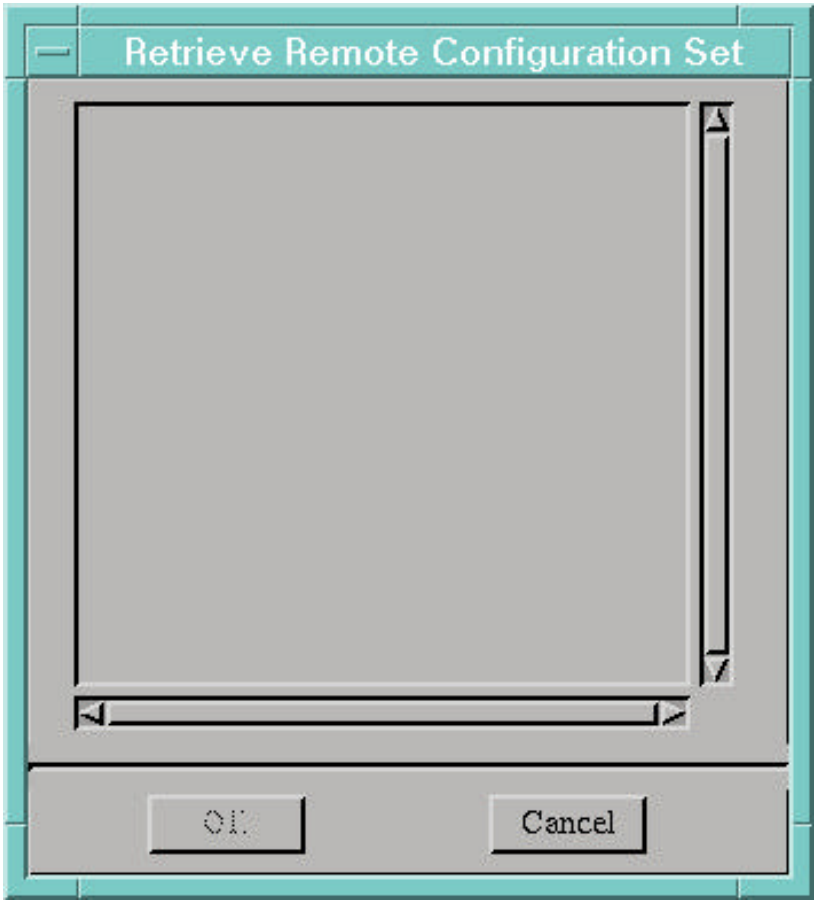
1 Click on the **VLSI-LRS subsystem icon** in the **Monitor** window.

The Quick Status window is displayed.

2 Click on the **Command...** button within the Quick Status display.

The list of commands for the selected VLSI system is displayed.

3 Hold the mouse button down, move the mouse cursor over **Retrieve Remote Configuation Set...**, and release the mouse button to display the following window.



5.6 Add Subsystems to Configuration Set

To add VLSI subsystems to a configuration set, perform the following:

1 Select **Add/Remove Subsystems...** from the Edit menu of the Configuration Set Editor window.

2 Select the desired subsystem from the **Available Subsystems** list. The selected subsystem highlights.

3 Click the **Add** button to add the selected subsystem to the list of subsystems in the configuration set. The selected subsystem is removed from the list of available subsystems and appears in the list of current subsystems.

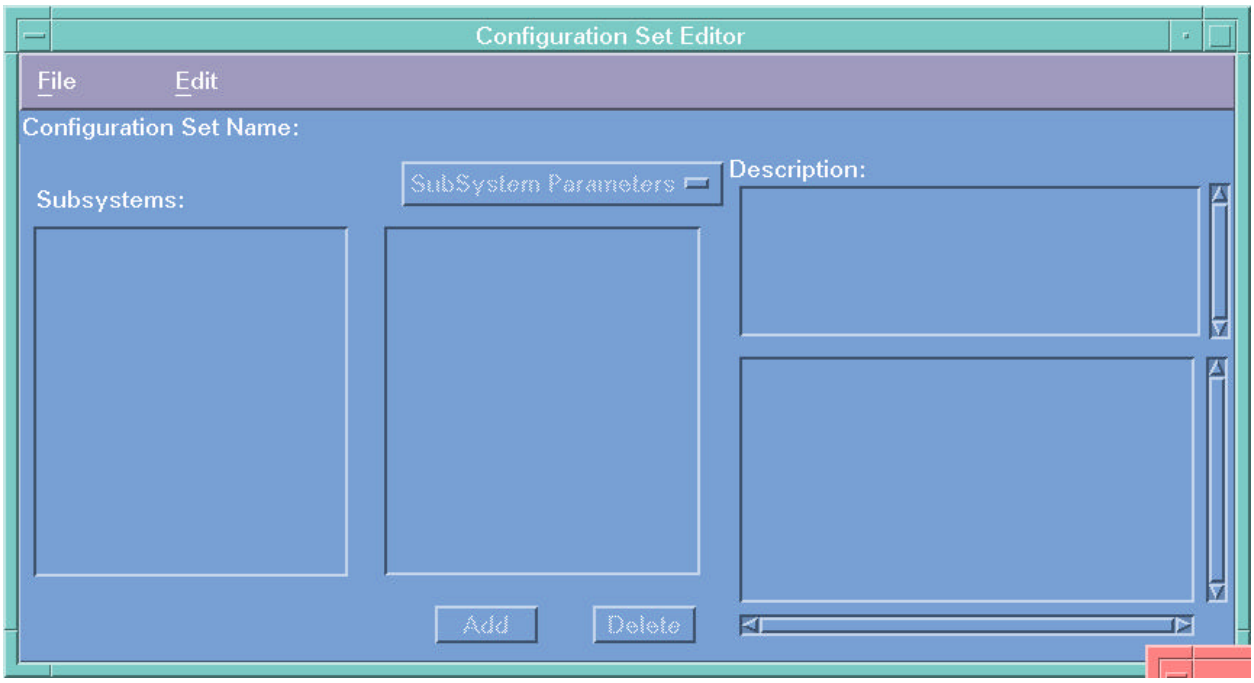
4 Repeat steps 2 and 3 until all desired subsystems are added to the configuration set.

5 Click the **Save** button to add subsystems to the configuration set. The **Subsystems** list in the Configuration Set Editor window updates to reflect the revised subsystem list.

5.7 Remove Subsystems from Configuration Set

To remove VLSI subsystems from a configuration set, perform the following:

1 Select **Add/Remove Subsystems...** from the Edit menu in the Configuration Set Editor window.



2 Select the subsystem to be removed from the **Subsystems in Configuration Set** list. The selected subsystem highlights.

3 Click the **Remove** button to remove the subsystem from the list of subsystems in the configuration set. The selected subsystem is removed from the list of current subsystems and appears in the list of available subsystems.

4 Repeat steps 2 and 3 until all desired subsystems are removed from the configuration set.

5 Click the **Save** button to replace the previous list of configuration set subsystems with the new list containing fewer subsystems. The **Subsystems** list in the Configuration Set Editor window updates to reflect the revised subsystem list.

5.8 Save Changes to a Configuration Set

Modifications to a configuration set do not take effect until changes are saved. Once changes are saved, they can only be undone by re-editing the schedule.

1 Select **Save** from the File menu in the Configuration Set Editor window. If the configuration set has not been given a name, a dialog box appears prompting the user for a new configuration set name.

2 Enter the name of the configuration set.

3 Click the **OK** button to save the configuration set.

5.9 Save Changes to a Different Configuration Set

If an existing configuration set was modified, the user can save changes as a new configuration set, rather than writing over the original.

1 Select **Save As...** from the File menu in the Configuration Set Editor window.

2 Enter the name of the configuration set.

3 Click the **OK** button to save the new configuration set with the given name.

5.10 Edit CBP Configuration

To edit telemetry processing parameters in a new Configuration Set, perform the following:

1 Select **New...** from the File menu in the **Configuration Set Editor** window.

A listing of the available configuration sets is displayed.

2 Highlight the Command Block Processor subsystem to show the associated parameters for configuring CBP.

3. Double click on a parameter, a subwindow is displayed. Enter appropriate value(s) associated with that parameter, as follow.

Command Data Block Length: 16384 (entry should be between 16384 and 65536**)**

Number of Command Data Blocks: 20 (entry should be between 20 and 80**)**

Message Type: 131

Source ID: 4

Destination ID: 1

Major EDOS Release: 1

Version of Major Release: 1

CDS Host Name: etsgsf1

CDS Host IP: 198.118.197.93

CDS Good Port: 3015 (for forward link only)

CDS Bad Port: 3010 (for forward link only)

EOC Port: 3020 (for forward link only)

Effect Switch: CBP (for forward link service) **or EDU** (for return link service)

Transfer Memory Base Address: 0 (for forward link service) **or 80100000** (for return)

Non Realtime EDU = {Block}

NRT EDU Transfer On = **Off**

NTR IP Address =

Port No. = **5001** (for return link service) or **0** (for forward link service)

RT 1 = {Block}

RT EDU Transfer On = **On** (for return link service) or **Off** (for forward link service)

RT IP Adress = **198.118.197.93**

Port No. = **5000**

RT 2 = {Block}

RT EDU Transfer On = **On** (for return link service) or **Off** (for forward link service)

RT IP Adress = **198.118.197.93**

Port No. = **5010**

RT 3 = {Block}

RT EDU Transfer On = **On** (for return link service) or **Off** (for forward link service)

RT IP Adress = **198.118.197.93**

Port No. = **5020**

RT 4 = {Block}

RT EDU Transfer On = **On** (for return link service) or **Off** (for forward link service)

RT IP Adress = **198.118.197.93**

Port No. = **5030**

RT 5 = {Block}

RT EDU Transfer On = **On** (for return link service) or **Off** (for forward link service)

RT IP Adress = **198.118.197.93**

Port No. = **5040**

5.11 Edit Forward Link Card Configuration

To edit telemetry processing parameters in a new Configuration Set, perform the following:

1 Select **New...** from the File menu in the **Configuration Set Editor** window.

A listing of the available configuration sets is displayed.

2 Highlight the Forward Link subsystem to show the associated parameters for configuring forward link card.

3. Double click on a parameter, a subwindow is displayed. Enter appropriate value(s) associated with that parameter, as follow:

Telecom Port: select Enable.

Nascom Port: select Disable

AOS Port: select Disable

D/C/E Command: select Disable

Echo Command: select NO

Data Mode: select THROUGHPUT

Clock Select: NCO (internal)

PB1 Fill: aa (selected pattern)

Parity Bit 0: 0

Parity Bit 1: 0

Acq Seq Length: 128

Output Clock Freq: 10.0

Crystal Freq: 25.0

Idle Clock: On

Idle Pattern: 55

J3 Timecode: Disable

Input Data Type: MEDS

DDD Header: Off

Send Response: No

Flush/Send: Flush the CLTU

Network Timeout: 0

Codeblock Length: 7 Bytes

Data Mode: defines card's primary mode of operation; toggles between throughput and encode. Throughput passes through a telecommand without alteration. Encode mode is used when the FLIC's input is raw data; it encodes data so that it conforms to CCSDS CLTU format prior to uplink. For current ETS LRS applications, the card always operates in throughput mode.

Clock Select: defines source of clock that is driving data as internal or external. For ETS LRS, field always indicates internal, meaning that it uses the onboard Numerically Controlled Oscillator (NCO) to provide clock.

Internal Clock Frequencies: allows operator to set up clock output frequency; card's maximum capability is 10 kHz. Crystal (MHz) should be set to 25.

Idle: setup determines if an idle pattern is output after the first CLTU is uplinked through the card. Field toggles between Yes and No. If Yes, the defined idle pattern is output after the first CLTU uplink until the card is shut down. If No, no idle pattern is output.

Idle Pattern: defines idle pattern that is output if Idle is set to Yes. Options are: 00 11, AA, and 55.

J3 Timecode: allows operator to disable or enable FLIC J3 pipeline timecode output. Field toggles between enable and disable.

PB1 Fill: defines hex byte pattern used to fill a dummy register on the card. The value entered does not affect processing; use the default value aa.

Parity Bit 0: value does not affect ETS LRS processing; use the default value 1.

Parity Bit 1: value does not affect ETS LRS processing; use the default value 1.

Acq. Seq. Length (0 - 4095): defines number of bits prepended to data; its pattern is alternating 0's and 1's, starting with 0. The default value is 132, but the field can be changed to reflect applicable mission requirements.

Input Data Type: defines card's expected input data format. Field toggles between Nascom and MEDS. For current ETS LRS applications, field is always MEDS.

DDD Header: applies only when input data type is Nascom (developed to support Deep Space Network [DSN] DDD header).

Send Response: MEDS data returns a MEDS header; Nascom data returns a Nascom block with the source and destination values swapped from the received format. If the Nascom block includes a DDD header, the response is the block and header source, and destination swapped in both.

Flush/Send: applies only when input data type is Nascom.

Network Timeout: works in conjunction with Flush/Send, and applies only when input data type is Nascom. Defines amount of time that FLIC waits between input blocks that contain CLTU before the Flush or Send is implemented. A value of 0 means wait forever.

Codeblock Length (4-7 bytes): data-dependent field that defines the format of the CLTU data field. The correct value is defined by the mission the card is supporting. In throughput mode, value is required to determine tail length; in encode mode, value is required to correctly encode data.

5.12 Edit Front-End Processor Card Configuration

To edit telemetry processing parameters in a new Configuration Set, perform the following:

1 Select **New...** from the File menu in the **Configuration Set Editor** window.

A listing of the available configuration sets is displayed.

2 Highlight the Front-End Processor subsystem to show the associated parameters for configuring a FEP card.

3. Double click on a parameter, a subwindow is displayed. Enter appropriate value(s) associated with that parameter, as follow.

Source: select InMux FP1.

InHrtb: enter 65535 (must enter **65535**)

Input Mux Block: {Block} see below

Clock Invert = **No**

Data Decode = **NRZL**

Data Delay Level = **0**

Nascom Block: {Block} see below

System Enabler = **Bypass** (select this parameter only)

Frame Sync Block: {Block} see below

Accept True/Invert Sync = **True**

Accept Forward/Reverse Sync = **Forward**

Forward True Sync = **1ACFFC1D**

Forward True Mask = **FFFFFFFF**

Reverse True Sync = **B83FF358**

Reverse True Mask = **FFFFFFFF**

Frame Annotator: {Block} see below

Annotation Format = **No**

Add Frame Length = **No**

Signature = **No**

User Signature = **0**

Frame GVCID = **No**

Block Quality = **No**

Frame Quality = **Yes**

Bit Offset = **No**

Time Source = **Mezzanine**

Fill Bytes = **0**

Frame Length = **266**

Reed-Solomon Decoder: {Block} see below

Subsystem Enabler = **Enable**

Encoded Offset = **14**

Frame Length = **266**

RS Header = **Detect**

RS Block = **Correct**

Codeword Length = **252**

Interleave Level = **1**

Quality Annotation = **Enable**

State Value = **0000000000000000**

Unroutable Frames = **Yes**

Reject Uncorr = **Yes**

Reject Short = **Yes**

Reject Long = **Yes**

Output Template = **Custom Frame**

Output Process = **4**

Output Start Address 1 = **10**

Output Start Address 2 = **0**

Output Start Address 3 = **2**

Output Start Address 4 = **266**

Output Start Length 1 = **256**

Output Start Length 2 = **2**

Output Start Length 3 = **8**

Output Start Length 4 = **32**

Frame Servicer Block: {Block} see below

Insert Service Register = **{Block}** This function is not used for ETS.

VCDU/SLC Register = **{Block}** This function is not used for ETS.

VCA Registers = **{Block}** This function is not used for ETS.

Fixed Service = **0**

Route Service = **0**

Filename = select **fp1rte** (only FEP1) or **fp2rte** (only FEP2), or **fp12rte** (both FEPs)

Route 1 = **Disable**

Route 2 = **Disable**

Route 3 = **Disable**

Route 4 = **Disable**

Routing Base Address = **26**

GVCID Block = **{Block}**

GVCID 1 = 1

GVCID 2 = 2

GVCID 3 = 3

GVCID 4 = 4

GVCID 5 = 5

GVCID 6 = 6

GVCID 7 = 7

GVCID 8 = 21

GVCID 9 = 3F

GVCID 10 = 0

GVCID 11 = 0

GVCID 12 = 0

GVCID Location = **4**

Output Channel 1 = {Block}

Enable = **Off**

Port = **Port 1**

Card Name =

Mail Box Name =

Zippy Address = **0**

Data Driver = **CPU**

Frame Per Block = **0**

Output Channel 2 = {Block}

Enable = **ETS-Time**

Port = **Port 4**

Card Name =

Mail Box Name =

Zippy Address = **0**

Data Driver = **CPU**

Output HRTB 0 = Enable

Output HRTB 1 = Disable

Output HRTB 2 = Disable

Output HRTB 3 = Disable

Output HRTB 4 = Disable

Output HRTB 5 = Disable

5.13 Edit Service Processor Card Configuration

To edit telemetry processing parameters in a new Configuration Set, perform the following:

1 Select **New...** from the File menu in the **Configuration Set Editor** window.

A listing of the available configuration sets is displayed.

2 Highlight the Service Processor subsystem to show the associated parameters for configuring Service Processor card.

3. Double click on a parameter, a subwindow is displayed. Enter appropriate value(s) associated with that parameter, as follow.

Frame size = 256
The raw frame length or the length of Channel Access Data Unit (CADU) in bytes.

Sync size = 4
Frame Sync Pattern size, 4 bytes, usually (1ACFFC1D).

Sync trailer size = 10
Number of bytes to include in the annotation field that the Frame Syncronizer will pass to the Service Processor regarding frame synchronization status. The selected size should be 2 or 10 bytes (if timecode is appended).

RS trailer size = 32
Number of bytes to include in the annotation field that the Reed-Solomon functions will pass to the Service Processor regarding Reed-Solomon decoding status. The selected size should be 32 bytes.

RS Interleave Depth = 1

Fill Pattern = C9
The fill pattern will be used to pad packets.

Secondary Header Size = 9
A secondary header is present in the CCSDS packet and has to be verified, specify a length of 9 bytes.

Zone Length = 7
If using insert service, specify the length of the insert zone in bytes. Used in conjunction with 'AOS Insert Present' below.

Delete Long/Short = Delete
Delete or Process Frames that are Long or Short.

Delete Bad Packets = Yes
Yes or no. Delete Packets with bad aplication ID (APID), bad length, no header, or bad time. Results will be displayed under 'Piece Information' on status page.

Delete Invalid VC = Delete

Delete or Reject frames with invalid VCID.

If Deleted - 'Frame Information' will be displayed on the status pages , but there will be no further processing done to frame and no status displayed for packets.

If Rejected - 'Frame Information' will be displayed on the status pages, and processing will continue displaying packet information.

Frames with CRC or RS Errors or 1st Header Pointer = Delete (**must select Delete**)
Delete or Rejected Frames with CRC or Reed-Solomon errors or invalid 1st header pointer.

If Deleted - 'Frame Information' will be displayed on the status pages , but there will be no further processing done to frame and no status displayed for packets.

If Rejected - 'Frame Information' will be displayed on the status pages, and processing will continue displaying packet information.

RS Encode = Yes
Are the frames Reed-Solomon encoded Yes or No.

RS Decode = Yes
Are the frames Reed-Solomon decoded Yes or No.

Frame Error Control Word Present = No
The error control word (16 bits) is used mostly at end the frame for cyclic redundancy code (CRC), for detecting errors when Reed-Solomon is not available.

Reject as Session Start = Reject (must select **Reject**)
Reject or Process packets from frames with Reed-Solomon or CRC errors at start of session (first 10 frames). Results will be displayed under 'Packet Information' on status page.

Reject Wrong Spacecraft ID = Reject (must select **Reject**)
Reject or Process packets from frames with wrong Spacecraft ID (SPID). Results will be displayed under 'Packet Information' on status page.

Reject Wrong Version = Reject (must select **Reject**)
Reject or Process packets from frames with wrong Frame version. Results will be displayed under 'Packet Information' on status page.

Reject Packets with Wrong Version = Reject (must select **Reject**)
Reject or Process packets with the wrong packet version. Results will be displayed under 'Packet Information' on status page.

Secondary Header Presence = Yes
Works in conjunction with "Secondary Header Size = 9" . A secondary header is present in the CCSDS packets and has to be verified, specify a length of 9 bytes.

RS Header Encode Presence = No

AOS Insert Presence = No

TF Version = 2
Identifies the Frame Version being used: 1 or 2

Packet Version = 1

Triggers = {Block} ''''''''''''''''''Not used at this time''

Packet Header Info = **No**

Packet Header Fixed Field Error = **No**

Packet Sequence Count Error = **No**

Packet Length Error = **No**

MPDU Header Fixed Field Error = **Yes**

VCDU Header Fixed Field Error = **Yes**

VC Count Error = **No**

RS Errors = **No**

Addl Triggers = {Block} ''''''''''''''''''Not used at this time''

Application ID Trigger = **No**

Packet Sequence Count = **No**

Packet Length Trigger = **No**

Spacecraft ID Trigger = **No**

VCID Trigger = **No**

VC Count Trigger = **No**

Enable Triggers = Disable ''''''''''''''''''Not used at this time''

Sources = 7
Number of sources being used (1-150). Used in conjunction with Source Table #1 - #150 below.

Annotation Option = 20

Error Tagging = FALSE ''''''''''''''''''Not used at this time''

Source Table # 1 = {Block}

VCID mask [0] = hex value use chart below to select Virtual Channel Identifier
VCID mask [1] = hex value (VCID) or VC

(example VC 10 has a mask[1]=0, mask[0]=400)

VC	mask[1] hex	mask[0] hex	VC	mask[1] hex	mask[0] hex	VC	mask[1] hex	mask[0] hex	VC	mask[1] hex	mask[0] hex
0	0	1	16	0	10000	32	1	0	48	10000	0
1	0	2	17	0	20000	33	2	0	49	20000	0
2	0	4	18	0	40000	34	4	0	50	40000	0
3	0	8	19	0	80000	35	8	0	51	80000	0
4	0	10	20	0	100000	36	10	0	52	100000	0
5	0	20	21	0	200000	37	20	0	53	200000	0
6	0	40	22	0	400000	38	40	0	54	400000	0
7	0	80	23	0	800000	39	80	0	55	800000	0
8	0	100	24	0	1000000	40	100	0	56	1000000	0
9	0	200	25	0	2000000	41	200	0	57	2000000	0
10	0	400	26	0	4000000	42	400	0	58	4000000	0
11	0	800	27	0	8000000	43	800	0	59	8000000	0
12	0	1000	28	0	10000000	44	1000	0	60	10000000	0
13	0	2000	29	0	20000000	45	2000	0	61	20000000	0
14	0	4000	30	0	40000000	46	4000	0	62	40000000	0
15	0	8000	31	0	80000000	47	8000	0	63	80000000	0

*63 is idle frame

Application ID = **1**
The application ID assigned to the packet (1-2047), 2047 being an idle packet.

Spacecraft ID = **2a**

Packet Length = **208 or 1664** **(**length of packet in bytes**)**

Sequence Count Increment = **1**
if 1, packets increment 1,2,3...
if 2, packets increment 1,3,5...

Service = **0** **(**must select **0)**

Output Packets = **2**
Select Real-time channel(s) 1 through 5, or Rate-Buffered

Route Bytes = **Fixed Length** **(**for the AFES (ACS) system Only)

Active = **Active** or **No**
Is this an active source. If not being used, select no.

CLCW = **Yes** or **No**

Yes if the source has a Command Link Control Word (CLCW), or No.

Source Table # 2 = {Block}

through ....

Source Table # 150 = {Block}

Example:

Source Table # 2 = {Block}
VCID mask [0] = 0 VC of 63 idle frame
VCID mask [1] = 800000000
Application ID = 2047 idle packet
Spacecraft ID = 2a
Packet Length = 208
Sequence Count Increment = 1
Service = 0
Output Packets = 2
Route Bytes = Fixed Length
Active = Active
CLCW = Yes

5.15 Edit Simulator Card Configuration

To edit telemetry processing parameters in a new Configuration Set, perform the following:

1 Select **New...** from the File menu in the **Configuration Set Editor** window.

A listing of the available configuration sets is displayed.

2 Highlight the Simulator subsystem to show the associated parameters for configuring Simulator card.

3. Double click on a parameter, a subwindow is displayed. Enter appropriate value(s) associated with that parameter, as follows:

File Recs: {Block} see below

Filename = **/ets/data/lrsrtpb2.cadu** or appropriate data file

Frame Size = **256**

Num Frames = **0**

Update = No Update

Update S/W = S/W Update

Clock Mode = Continuous

Ext Clock = NCO Clock

NCO Frequency = 512 Khz, 256 Khz, 16 Khz, or 1 Khz according to the desired scenario

Memory Access = Bank B

Mem A Mode = FT

EOS Simulator Card setup fields are defined as follows:

Data File Name: Define test data source file name. Data file name must have one of the following extensions: `.FRM` (indicates frame data) or `.BLK` (indicates Nascom block data, which is not typically used as input to ETS LRS).The data file is generated using Spacecraft Test Pattern Generator (SCTGEN) software.

Frame Size: Define number of bytes to be generated within a frame.

Frames: Define number of frames to be generated during a test.

Update: Specify if test data is generated with required update information.

Update S/W: Select No.

Clk Mode: Define clock type (e.g., Continuous [0], Invert Continuous [1], Gated [2], or Off [3])

External Clock: Select a clock source for card.

NCO Frequency (Mhz) : Define rate at which data is output from the card in Mbps.

5.16 High Rate Telemetry Backplane Configuration

To edit high rate telemetry backplane (HRTB) configuration in a new Configuration Set, perform the following:

1 Select **New...** from the File menu in the **Configuration Set Editor** window.

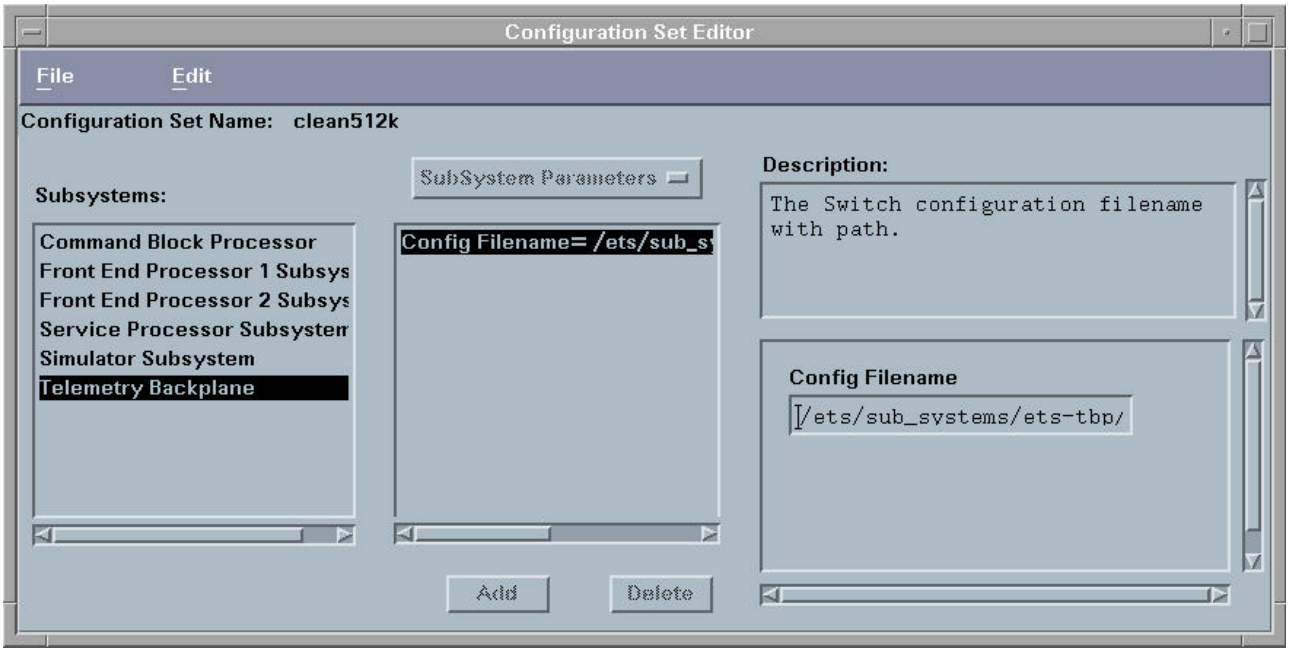
A listing of the available configuration sets is displayed.

2 Highlight the **Telemetry Backplane** subsystem.

3. Double click on a parameter, a subwindow is displayed. Enter appropriate filename associated with that catalog, as follow.

Config Filename = /ets/sub_systems/ets-tbp/bin/tpbfep12.cfg

Note: The filename **tpbfep12.cfg** has been configured through OPMAN to setup the proper output from FEP cards to Service Processor card. **Do not change the name of this file**.

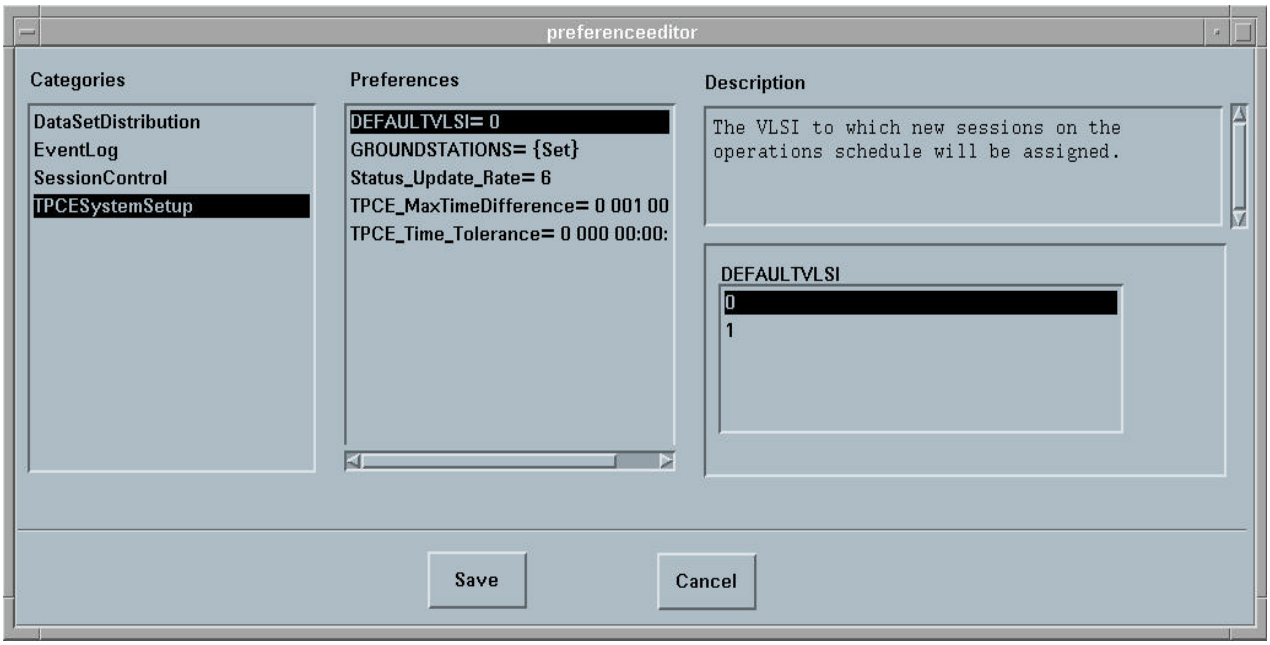

Configuration Set Editor
File
Edit
Configuration Set Name: clean512k
Subsystems:
SubSystem Parameters
Description:
The Switch configuration filename with path.
Command Block Processor
Front End Processor 1 Subsys
Front End Processor 2 Subsys
Service Processor Subsystem
Simulator Subsystem
Telemetry Backplane
Config Filename= /ets/sub_s
Config Filename
/ets/sub_systems/ets-tbp/
Add
Delete

Preference Editor
6

The section provides basic instructions on how to examine and modify preferences for boundaries, default values, etc. of the control environment's functions (i.e., the default system to schedule). Changes made with the preference editor are saved to a new preferences file and do not take effect automatically.

6.1 Display the Preference Editor

To display the Preference Editor window, select **Preferences...** from the Edit menu in the Monitor window.



6.2 View Preferences

Preferences are divided into groups of related preferences referred to as "categories." To examine a category's preferences, perform the following:

1 Select the desired category from the **Categories** list. The list of preferences appears in the **Preferences** list.

2 Select a preference to view its description. The preference's description appears in the **Description** field.

a. EventLog Preferences:

LogPrintCommand
Enter the following Unix command: **lpr -s**

MaxLogFileSize= 200000
The maximum number of bytes that a log file size will contain.

b. SessonControl Preferences:

EndMaxDataGap
The amount of time after loss of sync before session terminate.

GapEndTimer
The amount of time prior to Schedule LOS to send the value of preference EndMaxDataGap to the VLSI.

MaximumEnables=3
The maximum number of attempts to enable the VLSI system for a session before aborting.

MaximumSetups=3
The maximum number of attempts that the system will make to setup the VLSI system.

RecordStoptimer=0 000 00:02:00
This parameter is not used for LRS.

SessionSetup= 0 000 00:01:00
The amount of time (in seconds) necessary to setup the hardware prior to a realtime pass.

SessionShutdown= 0 000 00:00:30
The amount of time (in seconds) necessary to shutdown the hardware after completion of a realtime pass.

StartMaxDataGap= 0 000 00:00:30
The largest gap in data that might be received by the VLSI. This is set at the start of a session to account for possible spurious data gaps within the data stream.

c. TPCESystemSetup Preferences

DefaultVLSI= 0 Must select **0** (**do not select 1**).
The VLSI to which new sessions on the operations schedule will be assigned.

GroundStations= {Set} The list of ground stations. Default is DSS-16.

Status_Update_Rate= 6
The rate in seconds at which status displays are updated.

TPCE_MaxTimeDifference= 0 001 00:00:00
The largest time difference to allow the workstation clock to deviate from the time reported by the VLSI/Nascom hardware before resetting.

Time_Tolerance= 0 000 00:00:10
The amount of time to allow the workstation clock to deviate from the time reported by the VLSI/Nascom hardware before resetting the workstation clock.

6.3 Modify Preference Value

To modify a preference, perform the following:

1 Select the preference to be modified. The preference's modification tool appears.

2 Change the preference's value as desired.

3 Click **Validate** on the **Preferences Value** field.

6.4 Save Preference Changes

Modifications to preferences must be saved. Changes are saved to a new preference file that is not used by the system automatically.

Click the **Save** button in the **Preference Editor** window. Changes are saved and the **Preference Editor** window is closed.

6.5 Activate Preference Changes

Changes to preferences are made to a new preference file and are not activated automatically. In order to take effect, the new preference file must be copied into the proper directory.

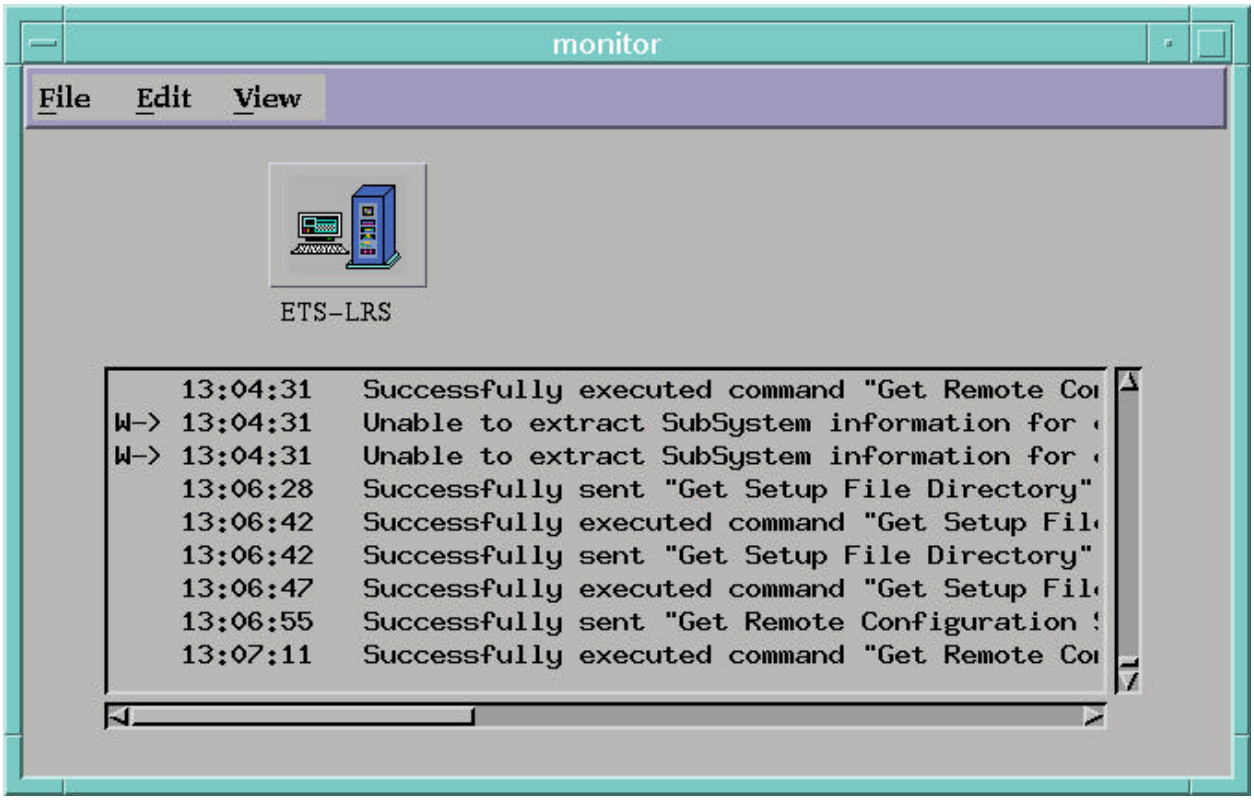
Consult a System Administrator about activating changes.

Event Log and Data Set Analysis
7

The Event Log contains messages pertaining to ETS LRS operation. These messages are generated automatically from the ETS LRS software. The messages can also be generated manually by operators of the ETS LRS. The information displayed in the Monitor window's scrolling list is the current event log information. The Data Set Analysis tool is used to display HEX Dump of archived file

7.1 View Current Event Log File

When the event log reaches a maximum predetermined file size, the log is closed and a new event log is created. The naming convention of event log files is based on the start and end times for opening and closing the event log. The current event log is contained in the Monitor window (ETS LRS main window).



7.2 Annotate Current Event File

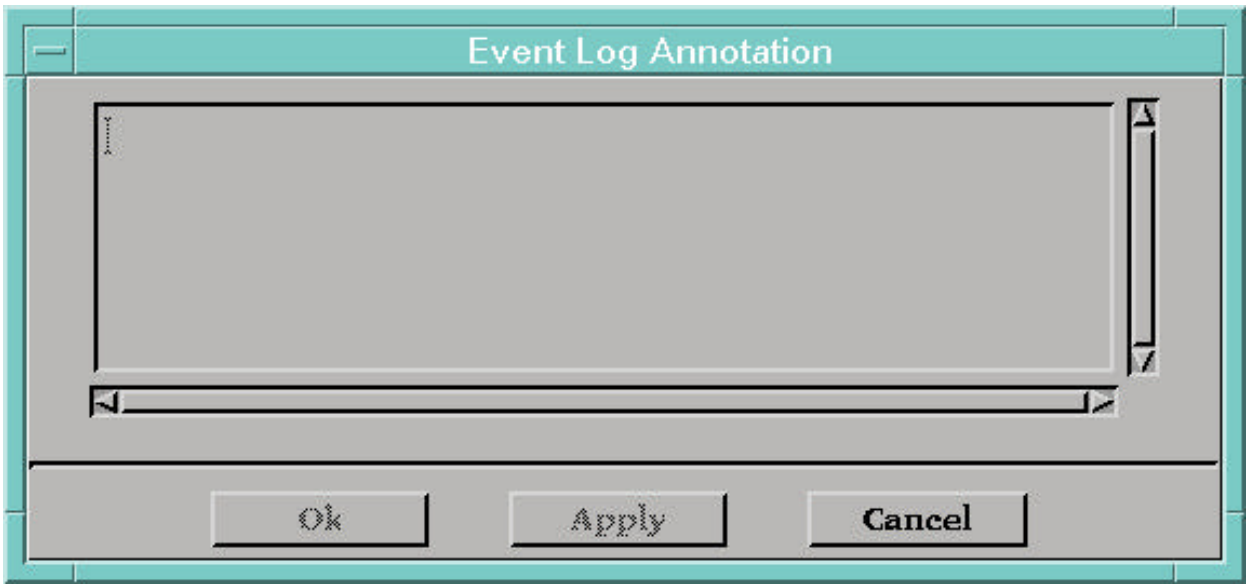
To annotate the current event log with notes or comments, perform the following:

1 Select **Add Event Note...** from the Edit menu in the Monitor window. The Event Log Annotation window is displayed.

2 Click on the text area in the Event Log Annotation window.

3 Enter the message text without pressing return. The text automatically wraps to the next line when the end of the line is reached.

4 Click **OK** or **Apply** to enter the message in the current event file. When a note is added, the date, time, and type of message are automatically entered in the event log.



Text Editing Techniques

Pressing the backspace/delete key while typing backs up and deletes characters one at a time. To delete a block of text, select the text and press the *Backspace/Delete* key. A block of text may be replaced by selecting the text to be replaced and entering the new text.

7.3 Turn On Debug Mode

Normally the event log does not display low-level debugging messages. When debug mode is turned on, these messages are displayed and logged in the current event log file. Normally, the user will not need to turn on debug mode.

Select **Debug On** from the View menu in the **Monitor** window. Debug messages are displayed and logged in the current event log file.

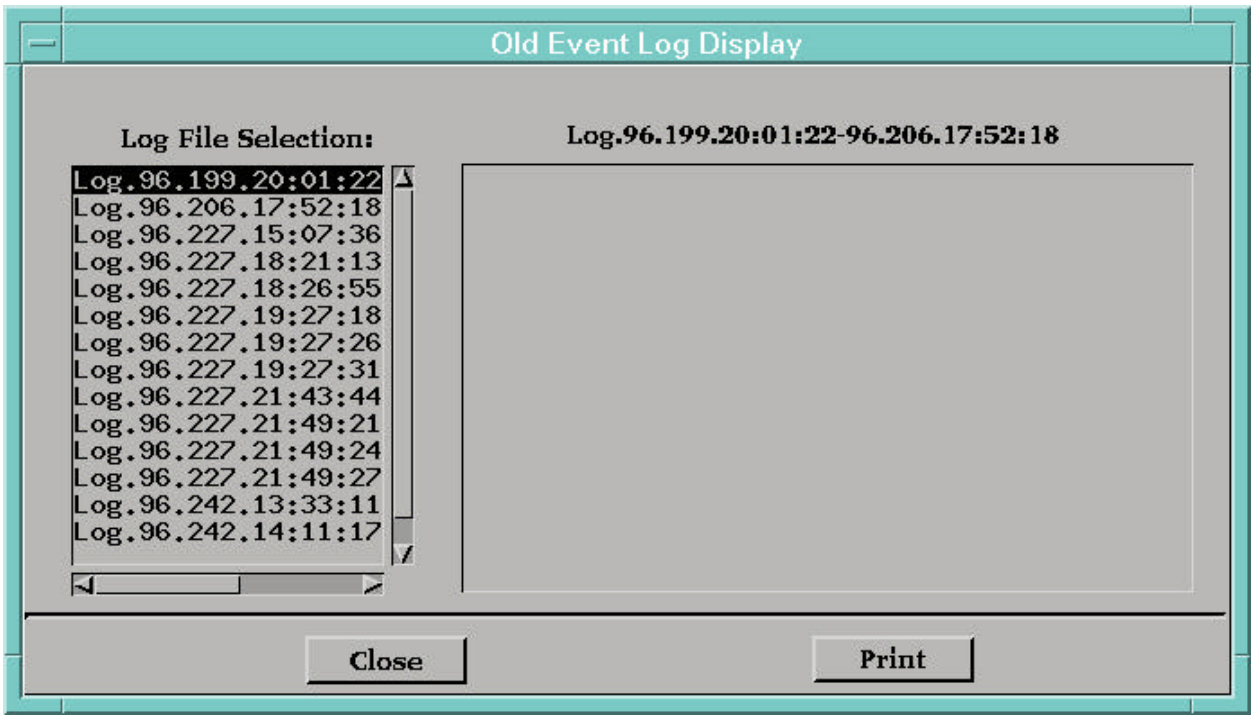
7.4 Turn Off Debug Mode

When debug messages are no longer needed, debug mode should be turned off.

Select **Debug Off** from the View menu in the **Monitor** window. The current event log file stops displaying low-level debug messages.

7.5 View/Print Old Event Log Files

1 Select **Old Event Log Files...** from the View menu in the Monitor window.



2 Select the event log file to be viewed from the **Log File Selection** list. The contents of the file appear in the scrolling window to the right of the Log File Selection list.

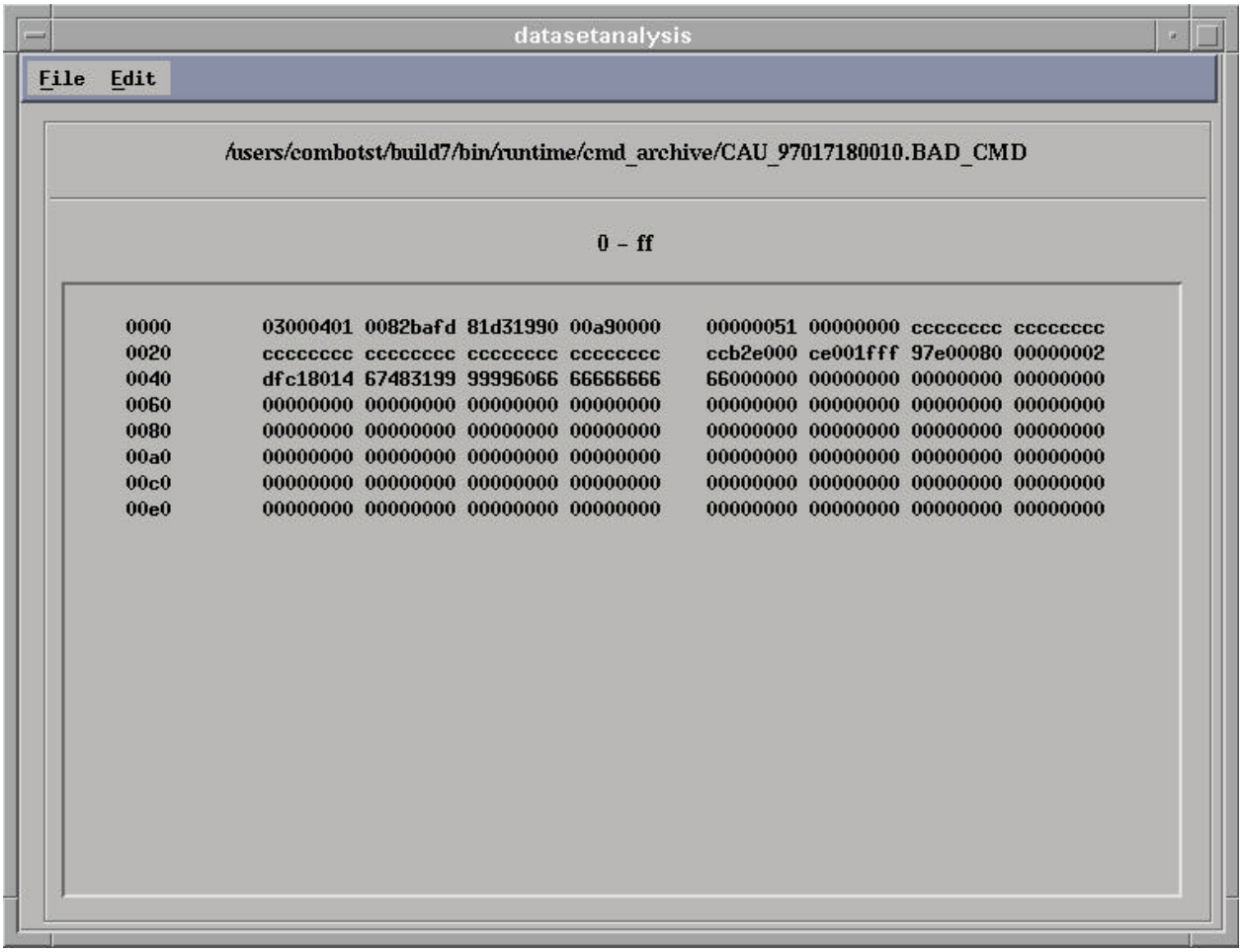
3 Click the **Print** button to print the displayed event log.

4 Repeat steps 2 and 3 to view and print other event log files.

5 Click the **Close** button when finished.

7.6 View Data Set Analysis WindowView Data Set Analysis Window

To invoke the Data Set Analysis tool, select **Data Set Analysis...** from the **View** menu in the Monitor window. DataSetAnalysis window will appear.



To view a hex dump of an archived file, perform the following:

1 Select the **Open Data Set** by clicking on the **File** at upper left most corner of this window.

2 A **File Selection Dialog** window will appear. Go to Rate_Buffer archive directory to view a rate-buffered file, or go to Command_Archive directory to view an archived file for Command Data Block. For example, use the following directories if you are using an account from test team.

- users/combotst/build7/bin/runtime/rate_buffer or

- users/combotst/build7/bin/runtime/cmd_archive

3 Click on the **Edit** at upper left most corner of the DataSetAnalysis window to select one of the following options to go to a desired section of the displayed file:

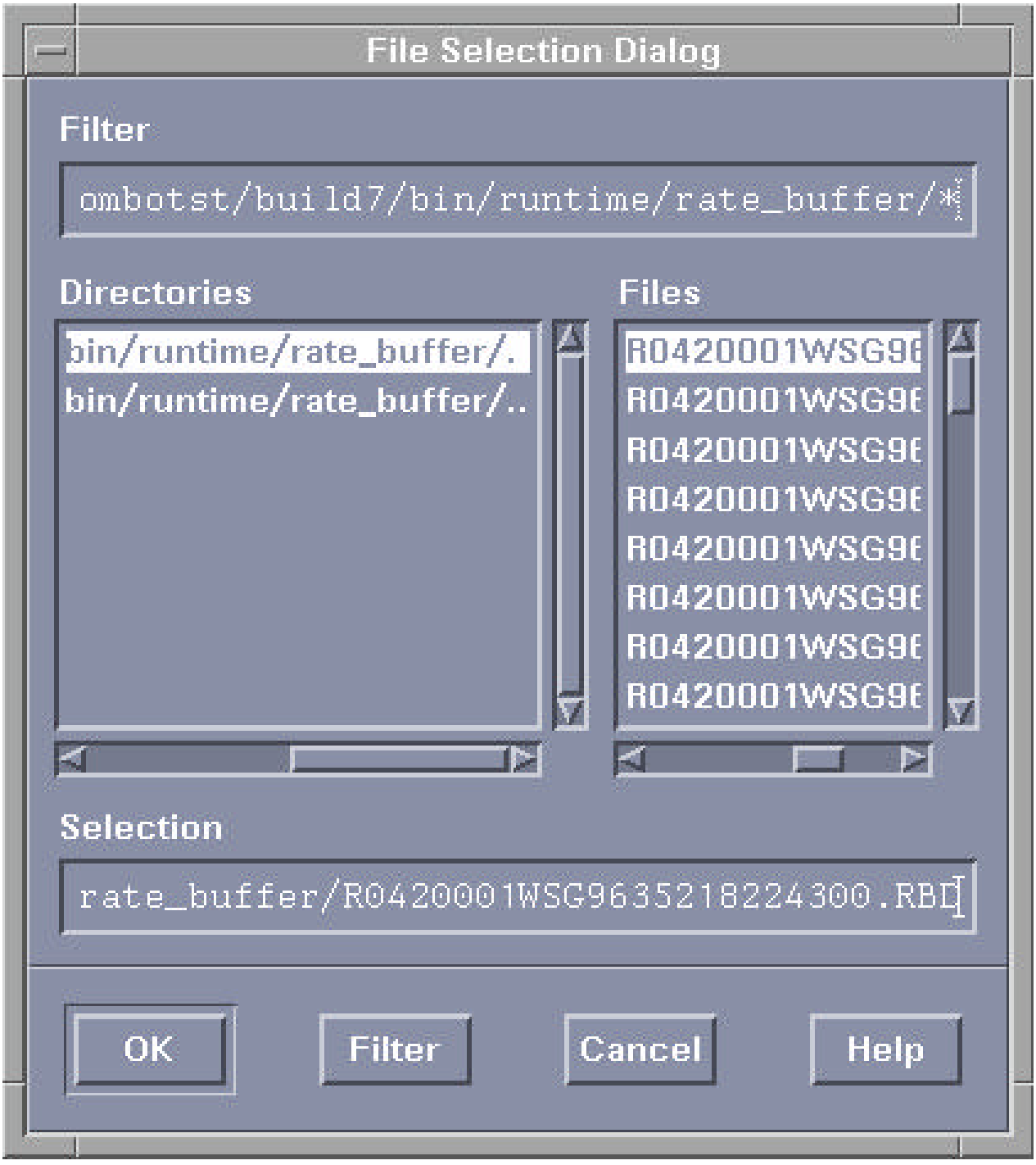
Top_of_File

Up_One_Page

Down_One_Page

End_of_File

5 Select **Quit** from the **File** menu in the Data Set Analysis window, when finished.



Status and Reports

8

Status windows allow the user to monitor the ETS LRS system. Status information is updated every 4 seconds so that the ETS LRS may be monitored in near-real time.

8.1 System Quick Status

Quick Status offers fast access to overall status information on the cards and the current session for a VLSI-LRS. Quick Status is accessed directly from the **Monitor** window using color coded icon or Event Log messages.

1 View color code of the **VLSI-LRS subsystem icon** in the **Monitor** window. The color of the VLSI-LRS icon reflects the status corresponding to the status of the cards.

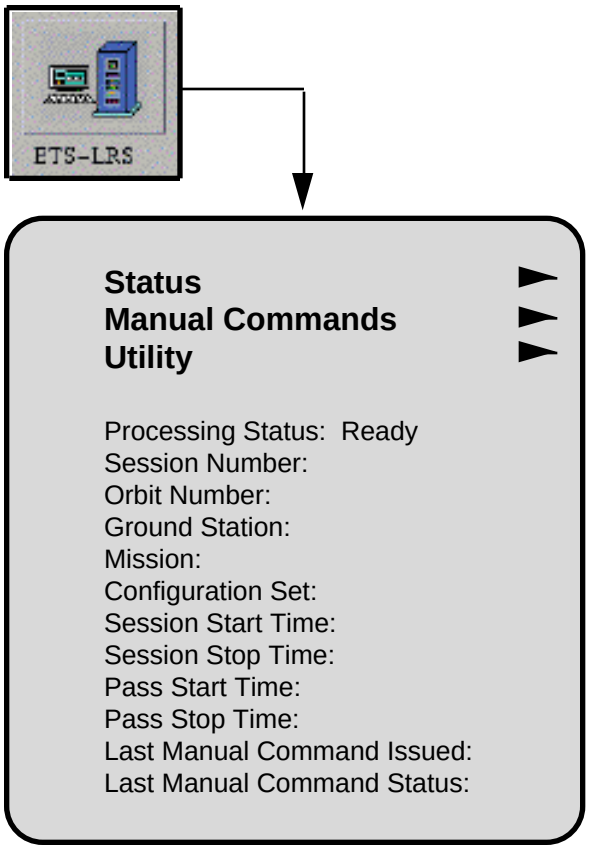
None: card is functioning correctly.

Yellow: card is booting.

Red: card is not functioning correctly and should be examined.

2 View Event Log in the Monitor window (e.g., failed to connect to VLSI 1).

3 Click on the **VLSI-LRS subsystem icon** in the **Monitor** window, a system quick status window appears.



8.2 Master Controller Card Status

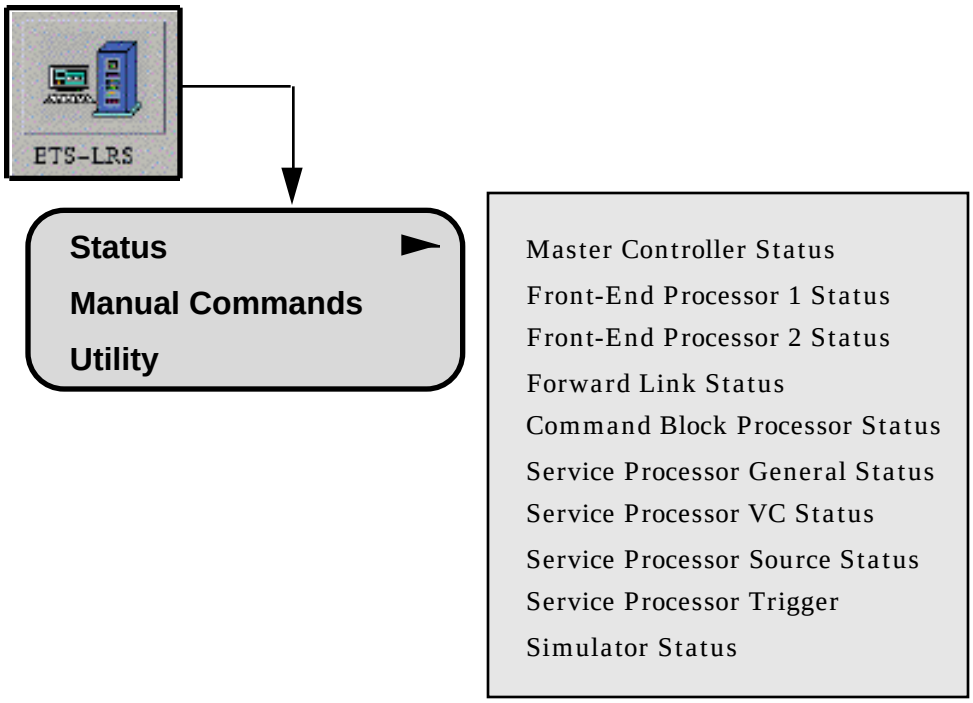
The Master Controller Card status window provides high-level status, including the current state of operation, currently loaded configuration set, and communication traffic numbers.

1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window displayed.

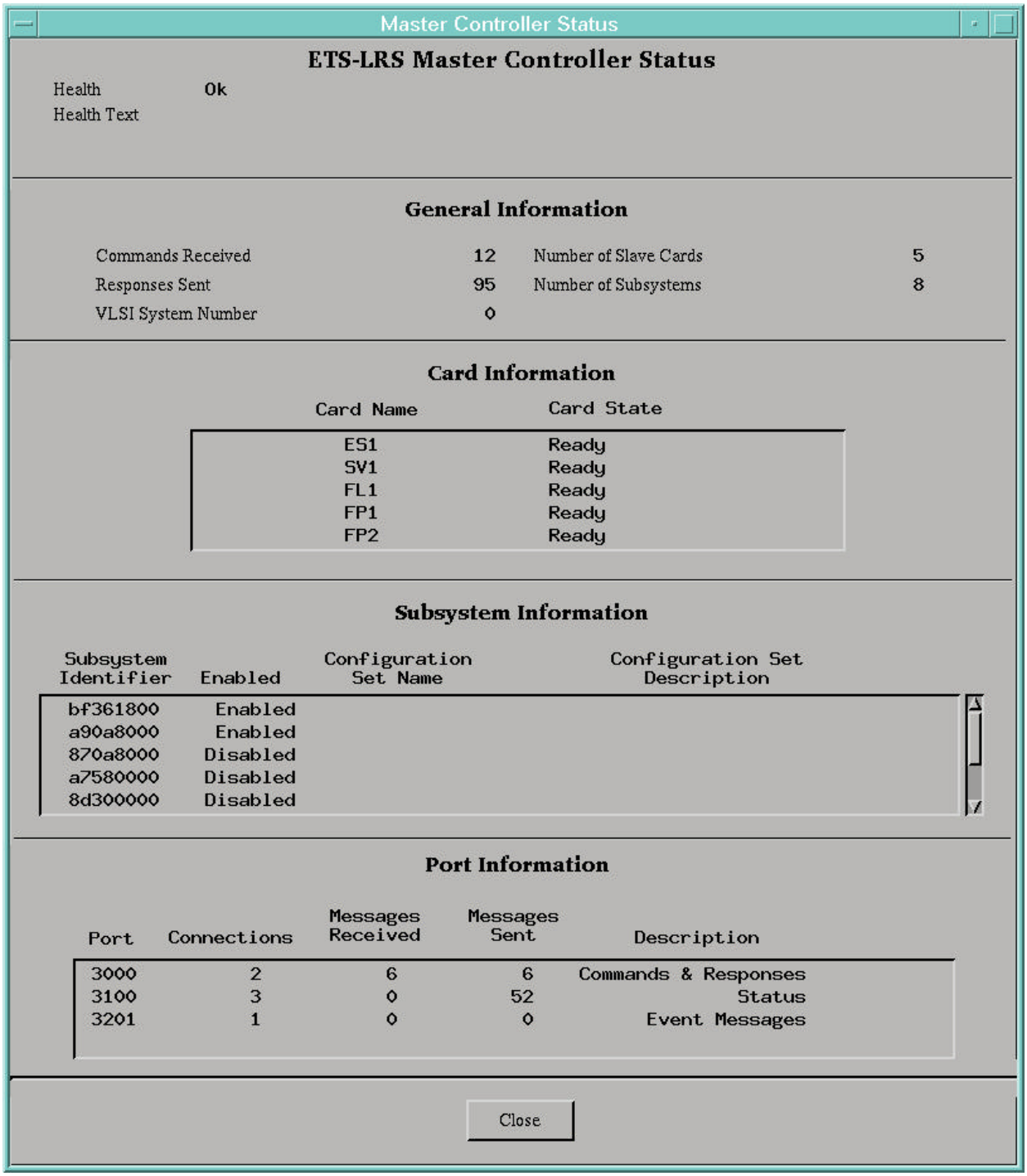
2 Click on the **Status...** button within the Quick Status display.

The list of subsystems for the selected VLSI system is displayed.



3 Hold the mouse button down, move the mouse cursor over **Master Controller...**, and release the mouse button.

The Master Controller Status window is displayed.



Fields are defined as follows:

General Information: Number of commands received from the workstation. Number of responses sent to the workstation.

Card Information: List of custom cards which either in Ready or Disable state.

Subsystem Information: List of subsystems which are either disabled or enabled.

Port Information: Number of ports and type of data associated with that port (e.g., status).

8.3 FEP Subsystem Status

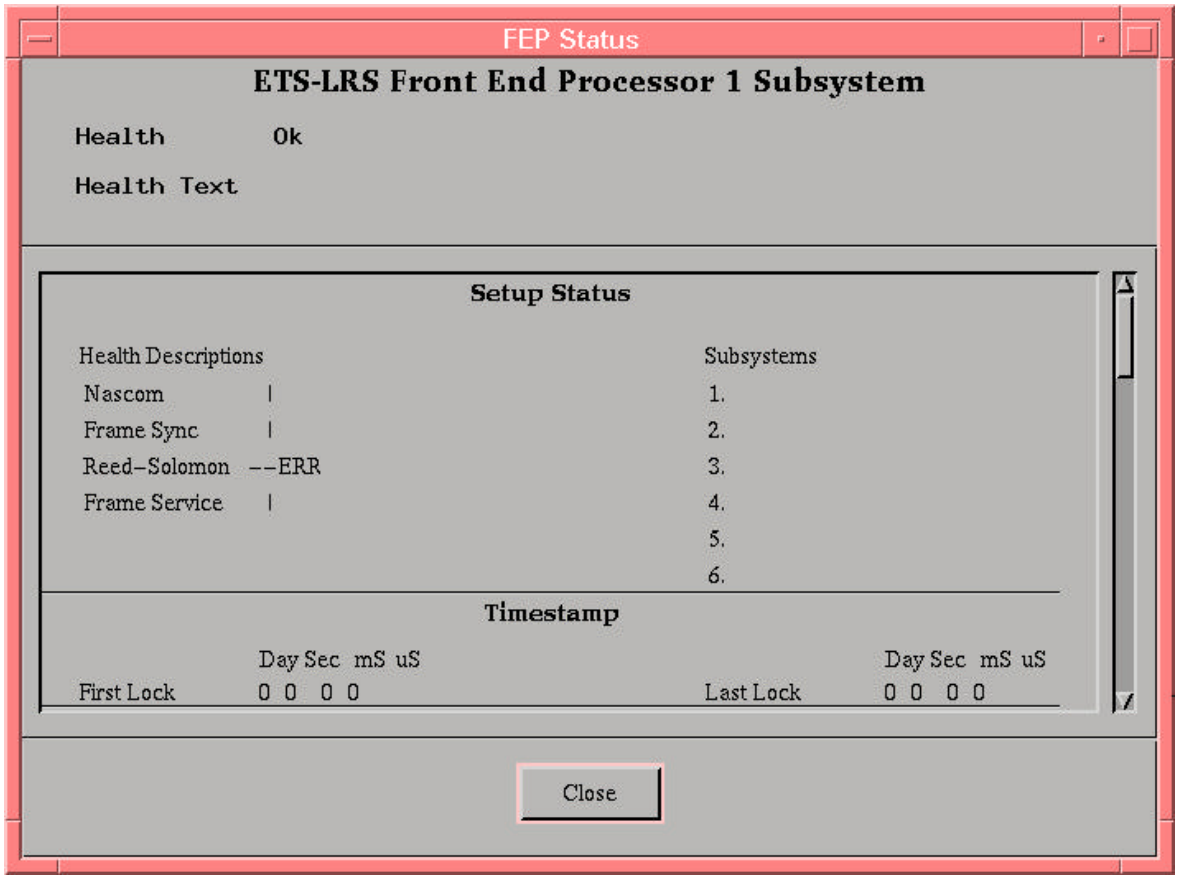
1 Click on the VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

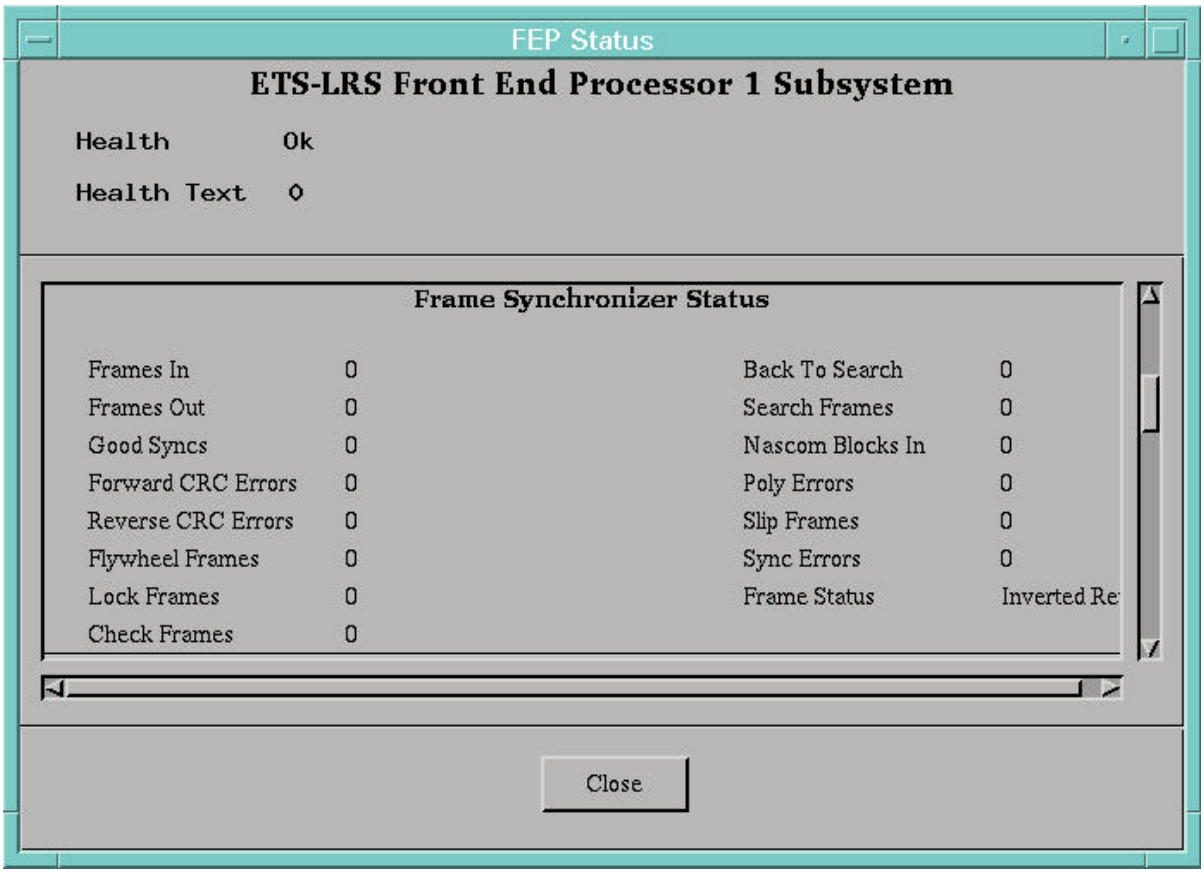
2 Click on the **Status...** button in the Quick Status display.

3 Hold the mouse button down, move the mouse cursor over **Front-End Processor 1 Status**, and release the mouse button to view overall status of FEP Card No. 1.

4 Hold the mouse button down, move the mouse cursor over **Front-End Processor 2 Status**, and release the mouse button to view overall status of FEP Card No. 2.



5 Scroll up and down to display the Frame Synchronizer Status, R-S Status, Frame Service Status, and Data Capture Status windows.



Fields are defined as follows:

Health: status of hardware during operation; may read Ok, Good, Bad, Dead, or Booting.

Frames In: value maintains a count of the number of frames recognized by the card.

Frames Out: value maintains a count of the number of frames output from the card. Depending on setup information, the card may output only lock frames, only check and lock frames, or all frames.

Good Sync: total number of frames which have good sync pattern.

Fwd CRC: field is valid with forward data; displays number of detected frames with CRC errors. The field is applicable only if the card is set up to check CRC. If the card checks CRC values, it calculates a frame CRC based on the data input and compares it to the expected CRC value that is supplied in the frame trailer; if the two values do not match, a CRC error is recorded.

Reverse CRC: field is valid with reverse data; displays number of CRC errors that occurred. The same criteria determines a Rev CRC Err as determines a Fwd CRC Err; the only difference is that it is reverse data that is under examination.

Flywheels: total number of flywheel frames detected. Flywheel frames are frames detected in lock mode with more bit errors than the set tolerance permits.

Lock Frames: maintains a count of frames processed in lock mode. The number of frames processed in lock mode is completely dependent on the setup of the card's search, check, and lock logic and the corresponding bit error tolerances. However, if no errors occur in the input data, once the logic has moved into lock mode, it stays in lock mode. Therefore, for error-free data, once this value starts to increment, it should continue to increment

without the Search Frames or Check Frames values incrementing.

Check Frames: maintains a count of frames processed in check mode. The number of frames processed in check mode is completely dependent on the setup of the card's search, check, and lock logic and the corresponding bit error tolerances. However, for the typical setup, and if no errors occur in the data, this value is between 0 and 15.

Back to Search: value is the number of times card switched from lock to search mode.

Search Frames: maintains a count of frames processed in search mode. The number of frames processed in search mode is completely dependent on the setup of the card's search, check, and lock logic and the corresponding bit error tolerances. However, for the typical setup, if no errors occur in the input data, only one search frame is reported.

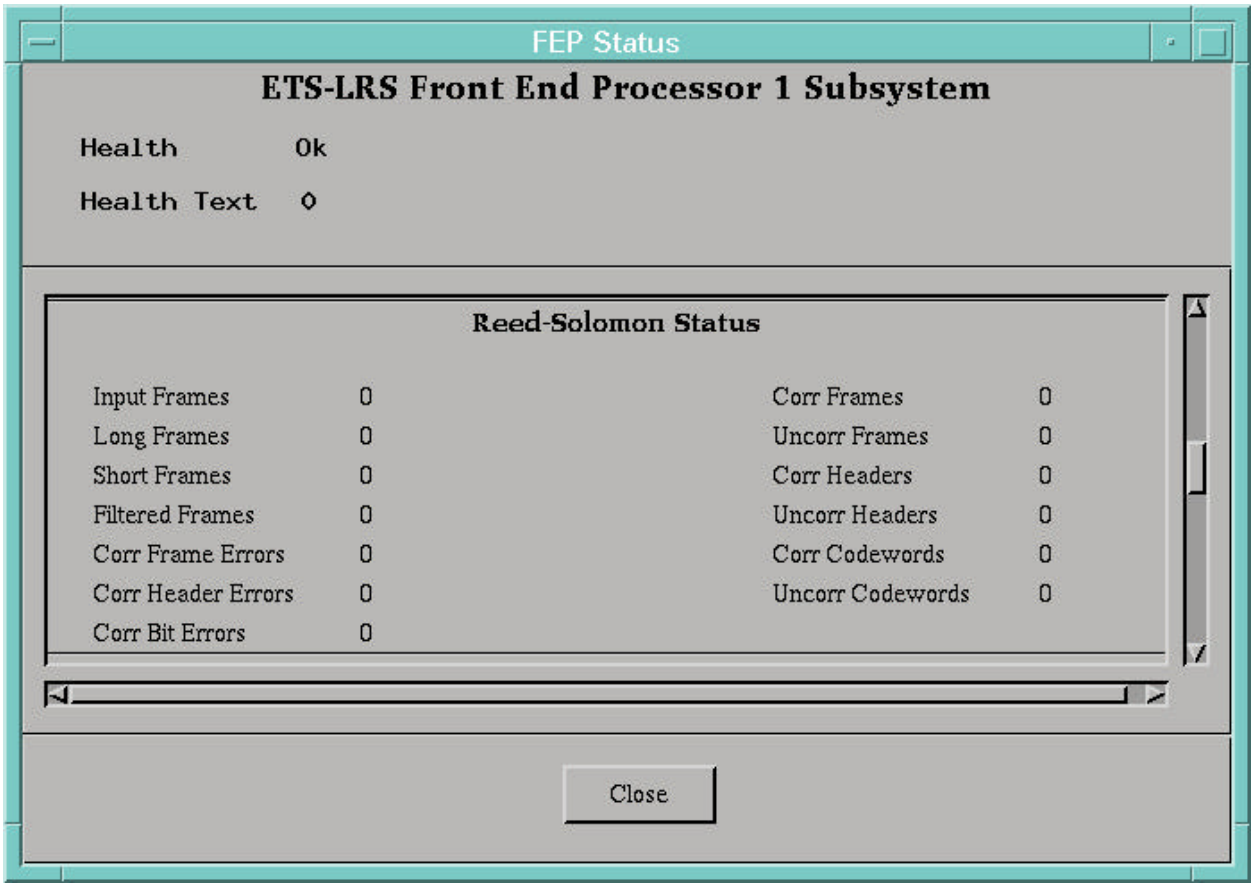
Nascom Blocks In: maintains a count of the number of Nascom blocks recognized by the card.

Poly Errors: number of frames processed with a long or short bit slip (frame was longer or shorter than expected length). If the FEP Card is not set up with a slip tolerance, frames that are too long or too short are not detected. If a slip tolerance is set, the card can only detect bit slips (long or short) that are less than or equal to the set tolerance.

Slip Frames: number of frames processed with a long or short bit slip (frame was longer or shorter than expected length). If the FEP Card is not set up with a slip tolerance, frames that are too long or too short are not detected. If a slip tolerance is set, the card can only detect bit slips (long or short) that are less than or equal to the set tolerance.

Sync Errors: displays number of detected frames with synchronization pattern errors. If card is not set up with a frame synchronization pattern bit error tolerance, frames with a synchronization pattern error will not be detected. If a synchronization pattern bit error tolerance is set, the card can only detect frames with synchronization pattern bit errors less than or equal to the set tolerance.

Frame Status: displays whether detected frames are in true, reverse, inverse.



Reed-Solomon Status

Input Frames: displays hexadecimal header of last Nascom block input to the Synchronizer Card.

Long Frames: number of frames input to the Reed-Solomon Card that were longer than expected length. Expected length is defined in card setup.

Short Frames: number of frames input to the Reed-Solomon Card that were shorter than expected length. Expected length is defined in card setup.

Filtered Frames: count of frames that Reed-Solomon circuitry received as input, but did not output.

Corr Frame Errors: count reports number of frames with detected errors (header or codeword) that were corrected.

Corr Header Errors: count reports number of frames with detected errors (header) that were corrected.

Corr Bit Errors: count reports number of frames with detected bit errors that were corrected.

Corr Frames: count reports number of frame headers in which card detected errors, and was able to correct.

Uncorr Frames: count of frames in which Reed-Solomon circuitry detected errors, but was not able to correct all.

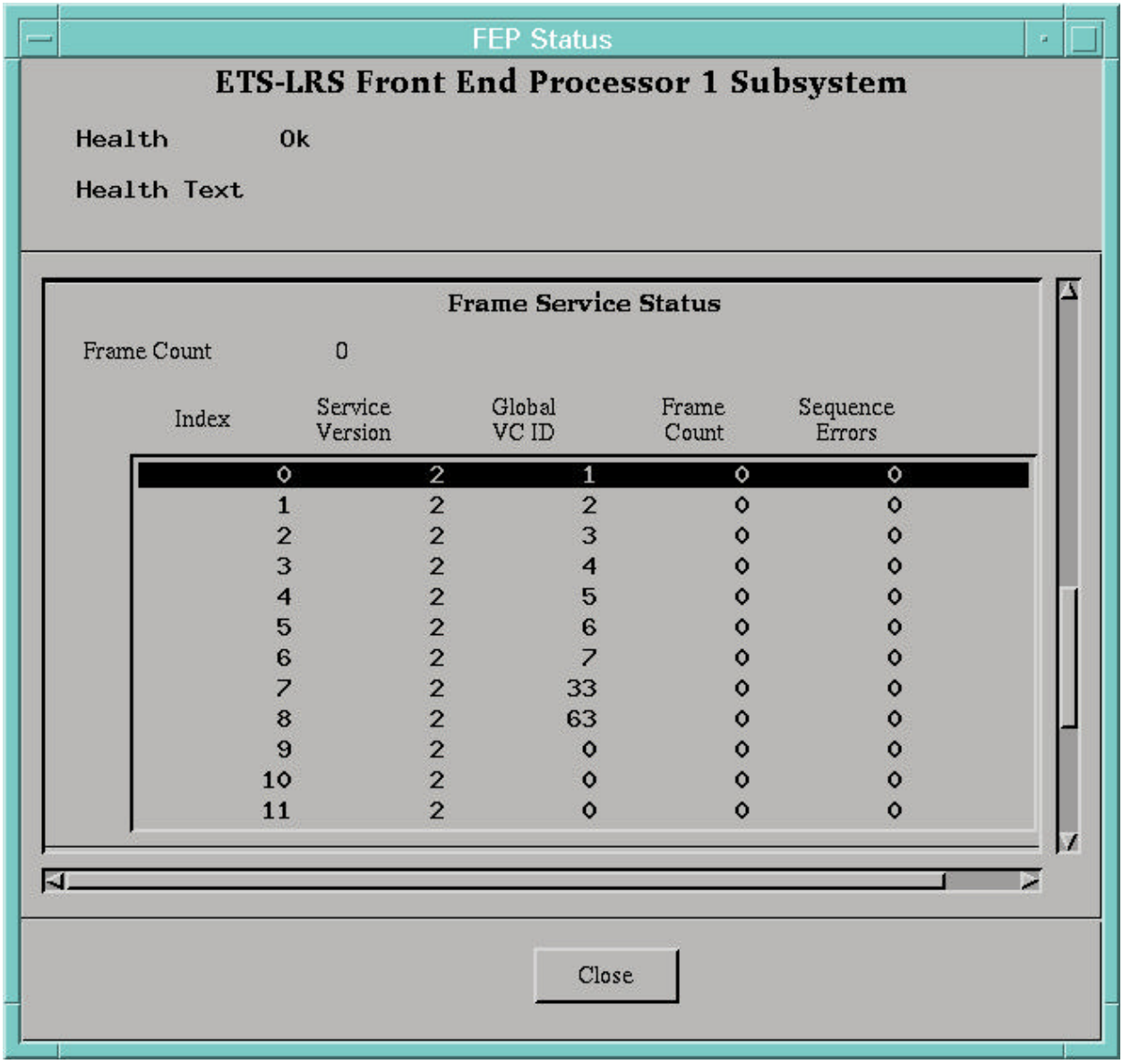
Corr Headers: count reports number of header errors both detected and corrected by the card. This field is not

applicable in passthrough mode. More than one error can occur in the same frame header; therefore, this field does not reflect the number of frames with header errors. For that value, refer to Headers Corrected field.

Uncorr Headers: count reports number of frame headers with uncorrectable errors.

Corr Codewords: count reports number of codeword errors detected and corrected by the Reed-Solomon Card. This field is not applicable in passthrough mode. More than one error can occur in the same codeword; therefore, this field does not reflect the number of codewords with header errors. For that value, refer to Codewords Corrected field. **NOTE**: Frames with interleave greater than one have more than one codeword.

Uncorr Codewords: count reports number of codewords with uncorrectable errors.



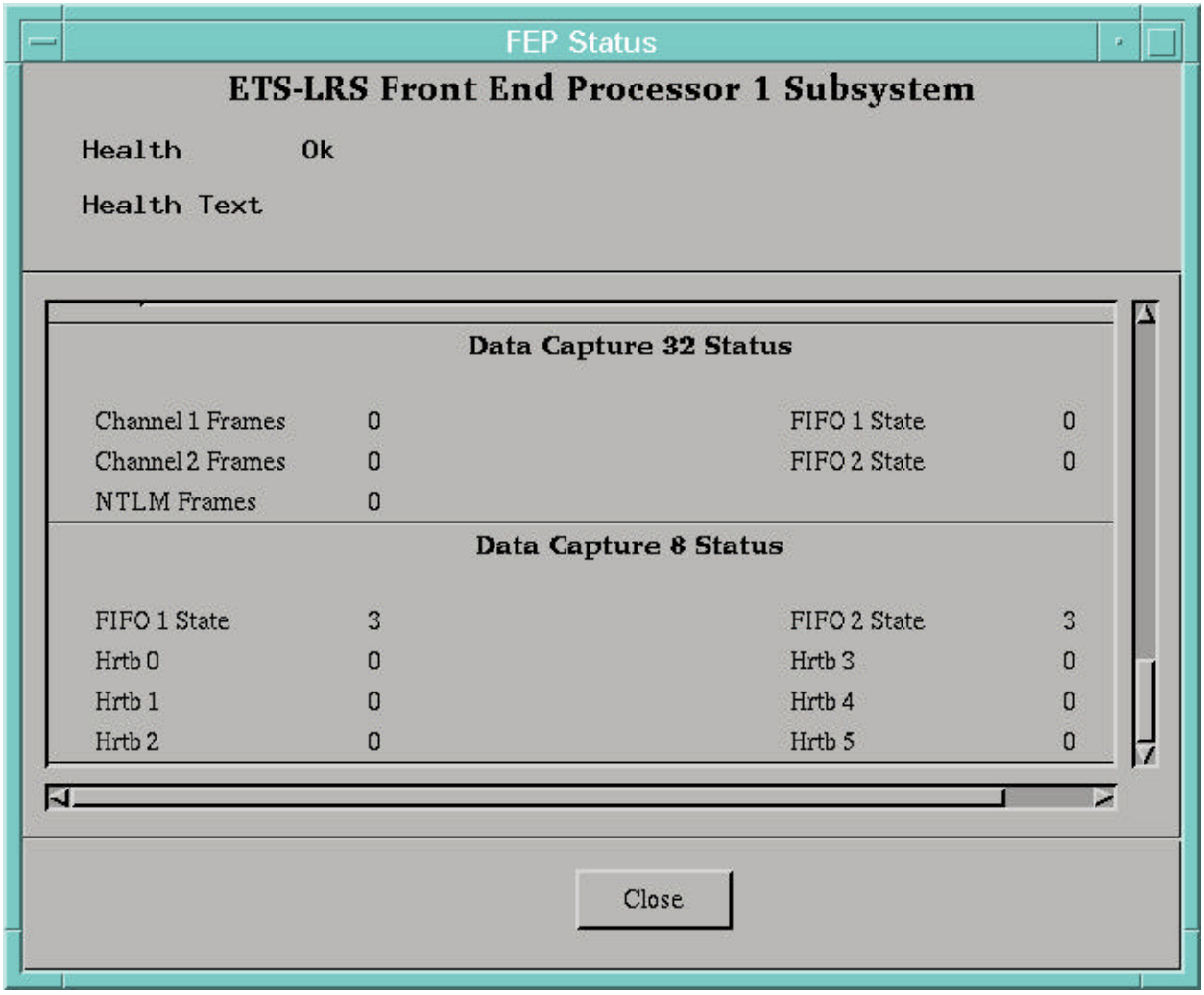
Frame Service Status

Frame Count: total count of frames received by the Frame Service circuitry during the session. If all VCIDs are routed to EOS Service Processor, the total counts of all VCIDs should add up to this value.

Service Version: indicate version number of frames. For ETS, Version 2 should be expected.

Global VCID: indicate VCID channel(s) that is/are selected for routing.

Sequence Errors: total number of virtual channel sequence errors detected by the FEP Card. The card monitors the virtual channel sequence value in the frame header, and increments this count whenever a discontinuity occurs (for each virtual channel input).



Data Capture Status

NOTE: These data capture status windows are for debugging only.

Channel 1 Frames: total count of frames going out the VME-1 bus.

Channel 2 Frames: total count of frames going out the VME-2 bus.

FIFO 1 State: indicate the state of FIFO 1 (e.g., empty, full, etc.)

FIFO 2 State: indicate the state of FIFO 2 (e.g., empty, full, etc.)

HRTB x: total number of frames output to selected HRTB channel(s).

8.4 Forward Link Status

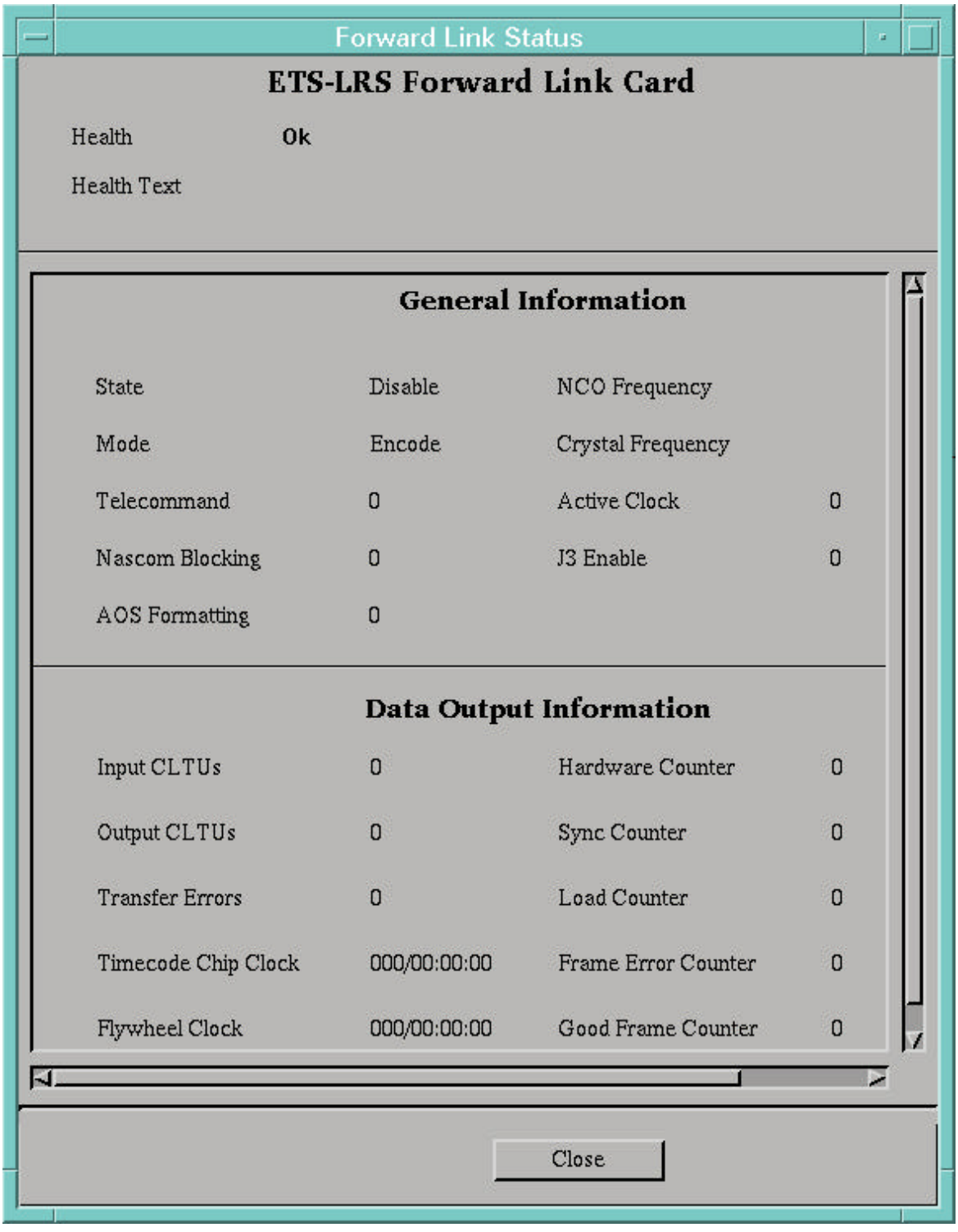
The Forward Link Interface Card status window provides detailed information on number of CLTUs being passed through the system as well as the data rate that CLTUs are sent to EOC.

1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on the **Status...** button within the Quick Status display.

3 Hold the mouse button down, move the mouse cursor over **Forward Link Interface Card Status**, and release the mouse button to display the following window.



Fields are defined as follows:

Health: status of hardware during operation; may read Ok, Good, Bad, Dead, or Booting.

State: reflects FLIC data processing. Idle indicates card is not processing any data input or output. Holding

indicates telecommand data is input and is currently being processed. Sending indicates data processing is complete, and data is being output for uplink.

Mode: provides card's primary mode of operation; throughput or encode. Mode is determined by card setup.

Telecommand: indicates whether card is ready to process data (Disable/Enable).

Nascom Blocking: indicates whether card is ready to process data (Disable/Enable).

AOS Formatting: indicates whether card is ready to process data (Disable/Enable).

NCO Frequency: defines card's data output rate, which reflects card setup. Crystal (MHz) field provides card's onboard crystal frequency, which is a set value and can not be changed.

Active Clock: defines card's clock source, internal or external. This field reflects card setup.

J3 Timecode: field is reported as Enable or Disable, and reflects card's setup. Status indicates whether timecode is being output from the FLIC to the J3 pipeline for use by the Synchronizer Card.

Input CLTUs: count of the number of CLTUs that card received for uplink.

Output CLTUs: count of the number of CLTUs that card output for uplink.

Transfer Errors: reflects FLIC telecommand data I/O errors.

Timecode Chip Clock: reflects card's calculated PB1 time based on timecode input.

Flywheel Clock: reflects card's flywheel time based on timecode input.

Hardware Counters: fields report value of specific hardware status registers.

Sync Counter: count reports number of CLTU synchronization patterns recognized by FLIC hardware.

Load Counter: count reports number of times timecode was loaded into hardware registers.

Frame Error Counter: count reflects number of bad timecode frames FLIC received.

Good Frame Counter: count reflects number of good timecode frames FLIC received.

8.5 Command Block Processor Status

The Command Block Processor status window provides detailed information on number of Command Data Block (CDBs) being processed by the system.

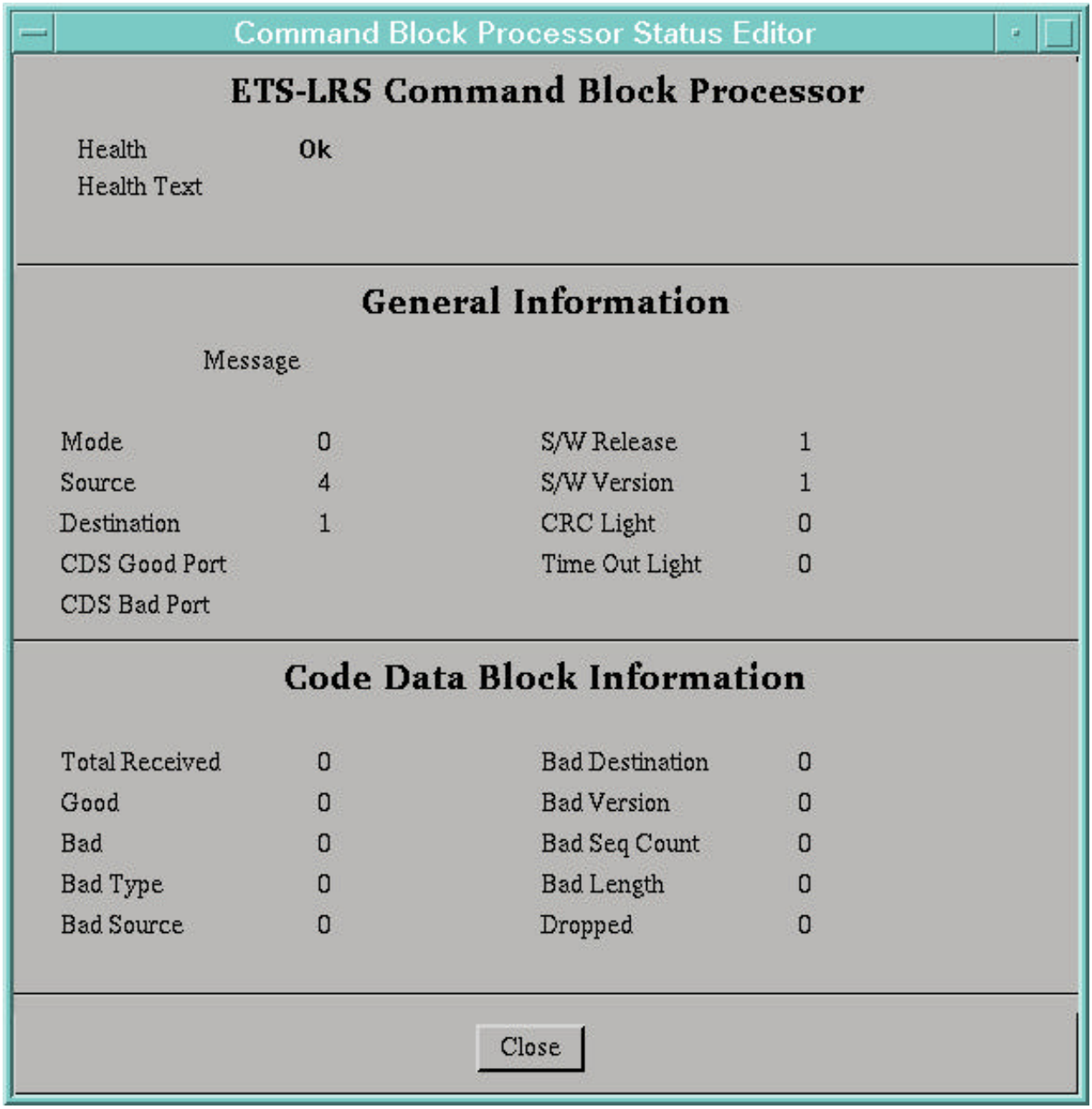
1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on the **Status...** button within the Quick Status display.

The list of subsystems for the selected VLSI system is displayed.

3 Hold the mouse button down, move the mouse cursor over **Command Block Processor Status**, and release the mouse button to display the following window.



Fields are defined as follows:

Health: status of hardware during operation. Field may read Ok, Good, Bad, Dead, or Booting.

General Information

EDOS Ground Message Header Settings

Mode: indicate valid value of the message type in the GMH.

Source Identification: indicate valid source identification number in the GMH.

Destination Identification: indicate valid destination identification number in the GMH.

Network Status

CDS Good port is: indicate port number where good CDBs are sent to Control & Display System.

CDS Bad port is: indicate port number where bad CDBs are sent to Control & Display System.

EDOS Software Version Number:

Major Release: indicate major release number of software to be checked in the GMH.

Version Number: indicate version number of software release in the GMH.

Command Data Blocks Information

Total Received: indicate total number of CDBs received from EOC.

Good: indicate total number of CDBs that passed validation.

Bad: indicate total number of CDBs that failed validation.

Bad Type: indicate total number of CDBs that failed message type validation.

Bad Source: indicate total number of CDBs that failed source ID validation.

Bad Destination: indicate total number of CDBs that failed destination ID validation.

Bad Version: indicate total number of CDBs that failed valid version number validation.

Bad Sequence Count: indicate total number of CDBs that failed sequence count validation.

Bad Length: indicate total number of CDBs that failed message length validation.

Dropped: indicate total number of CDBs that were dropped due to buffer overflow.

8.6 Service Processor Status

The Service Processor General status window provides detailed information on the packet assembly being processed by the system.

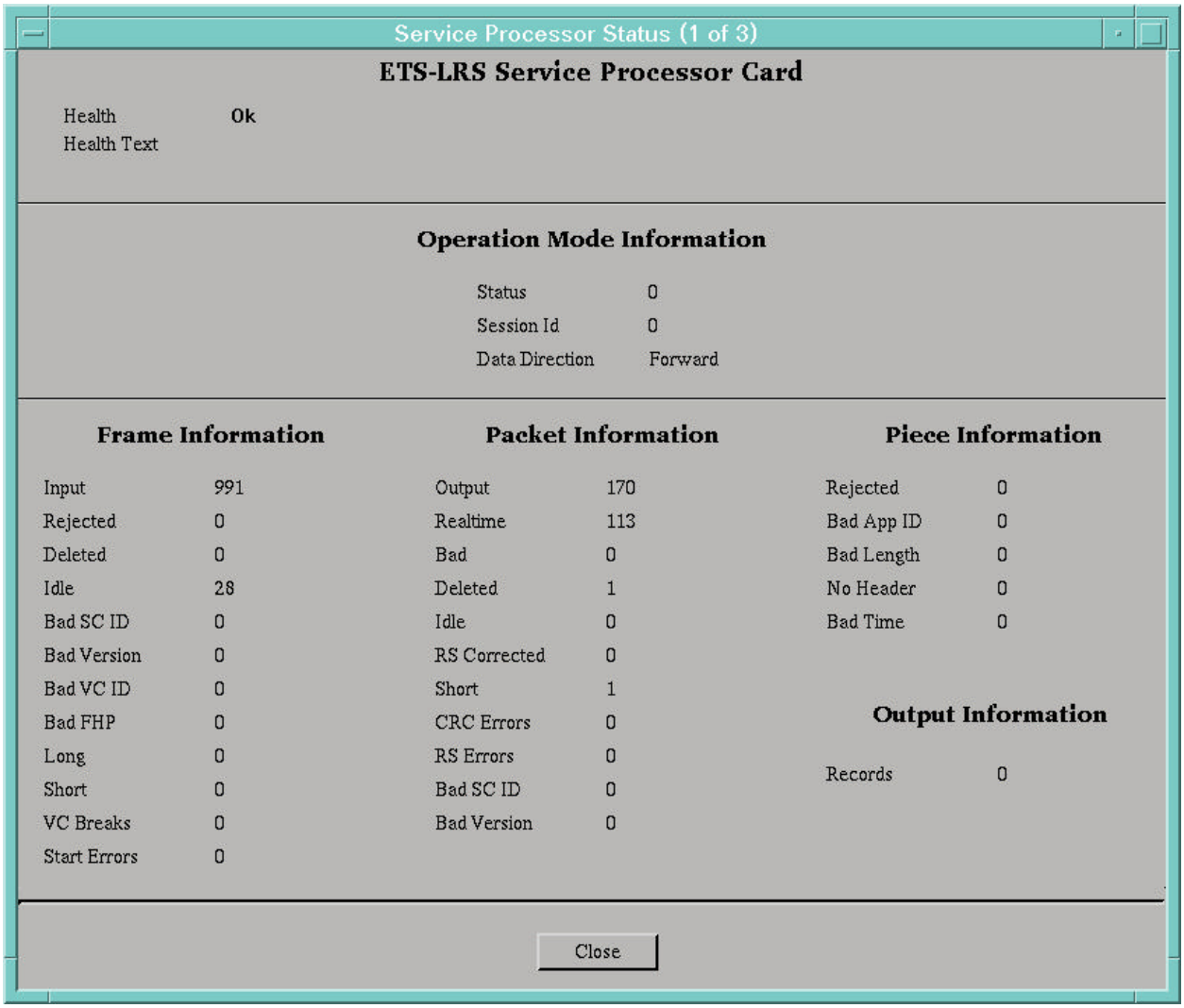
1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on the **Status...** button within the Quick Status display.

The list of subsystems for the selected VLSI system is displayed.

3 Hold the mouse button down, move the mouse cursor over **Service Processor General Status**, and release the mouse button to display the following window.



Fields are defined as follows:

Health: status of hardware during operation; may read Ok, Good, Bad, Dead, or Booting.

Frame Information:

Input: count of frames recognized by the card.

Rejected: count of rejected frames per annotated information from FEP(s). Packet processing can be performed by the EOS Service Processor.

Deleted: count of deleted frames per annotated information from FEP(s). Packet processing will not be performed by the EOS Service Processor.

Idle: count of idle frames recognized by FEP(s).

Bad SPID: count of frames with bad spacecraft identifier.

Bad Version: count of frames with incorrect version number. For ETS, frames with Version 2 are valid.

Bad VCID: count of frames whose VCID is not identified in the processing catalog.

Bad FHP: count of frames with bad first header pointer.

Long: count of frames with incorrect length (longer than expected).

Short: count of frames with incorrect length (shorter than expected).

VC Breaks: count of frames with sequence counts that are not contiguous.

Start Errors: count of frames with starting sequence counts not as expected.

Packet Information:

Output: count of valid packets recognized by the card.

Realtime: count of real-time packets recognized by the card.

Bad: count of packets recognized by the card as having invalid parameters.

Deleted: count of packets deleted from the output queue.

Idle: count of idle packets recognized by the card.

RS Corrected: count of packets extracted from R-S correctable frames.

Short: count of packets shorter than expected length. Expected length is defined in card setup.

CRC Errors: number of packets embedded in frames with CRC errors.

RS Errors: number of packets embedded in frames with Reed-Solomon errors.

Bad SPID: number of packets embedded in frames with bad spacecraft identifiers.

Bad Version: number of packets with incorrect version numbers.

Piece Information:

Rejected: number of packets rejected or deleted by the card.

Bad App ID: number of packets with an invalid application process identifier.

Bad Length: number of packets shorter or longer than expected length. Expected length is defined in card setup.

No Header: number of packets unrecognizable by the card.

Bad Time: number of packets with invalid time fields.

Output Information:

Records: value maintains number of records being transferred via DMA.

The Service Processor Virtual Channel status window provides detailed information on the individual VC being processed by the system.

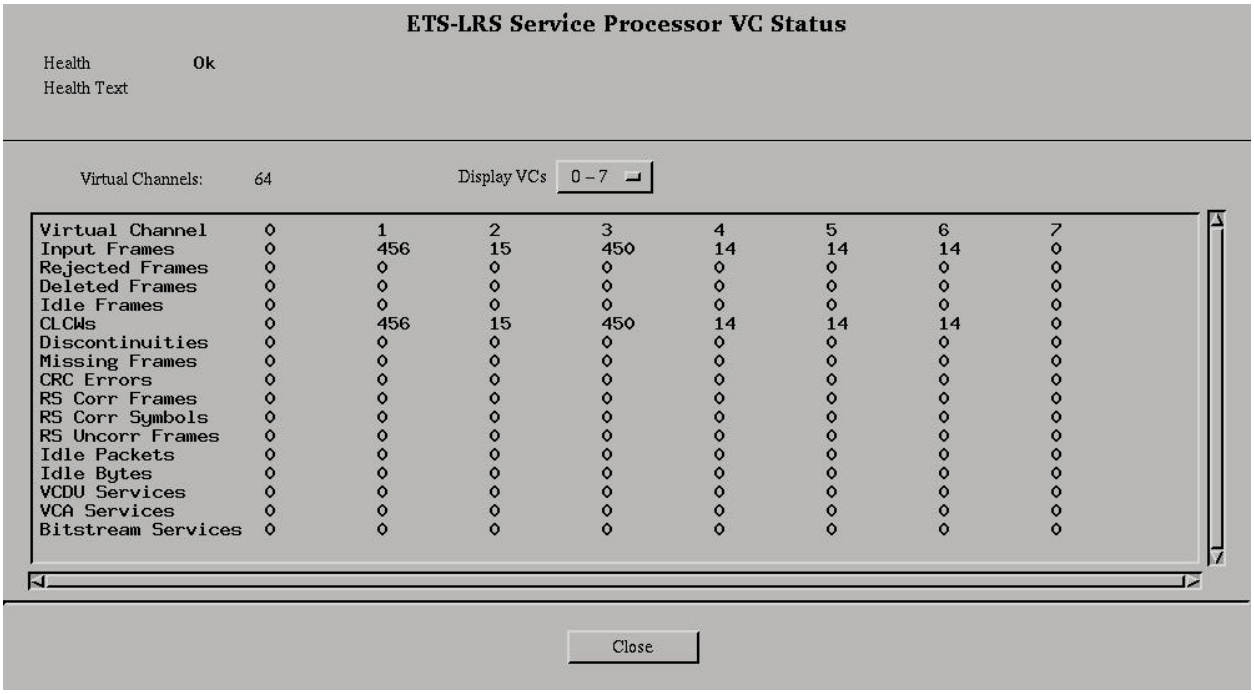
1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on the **Status...** button within the Quick Status display.

The list of subsystems for the selected VLSI system is displayed.

3 Hold the mouse button down, move the mouse cursor over **Service Processor VC Status**, and release the mouse button to display the following window.



Virtual Channel	0	1	2	3	4	5	6	7
Input Frames	0	456	15	450	14	14	14	0
Rejected Frames	0	0	0	0	0	0	0	0
Deleted Frames	0	0	0	0	0	0	0	0
Idle Frames	0	0	0	0	0	0	0	0
CLCWs	0	456	15	450	14	14	14	0
Discontinuities	0	0	0	0	0	0	0	0
Missing Frames	0	0	0	0	0	0	0	0
CRC Errors	0	0	0	0	0	0	0	0
RS Corr Frames	0	0	0	0	0	0	0	0
RS Corr Symbols	0	0	0	0	0	0	0	0
RS Uncorr Frames	0	0	0	0	0	0	0	0
Idle Packets	0	0	0	0	0	0	0	0
Idle Bytes	0	0	0	0	0	0	0	0
VCDU Services	0	0	0	0	0	0	0	0
VCA Services	0	0	0	0	0	0	0	0
Bitstream Services	0	0	0	0	0	0	0	0

The Service Processor Source status window provides detailed information on individual source being processed by the system.

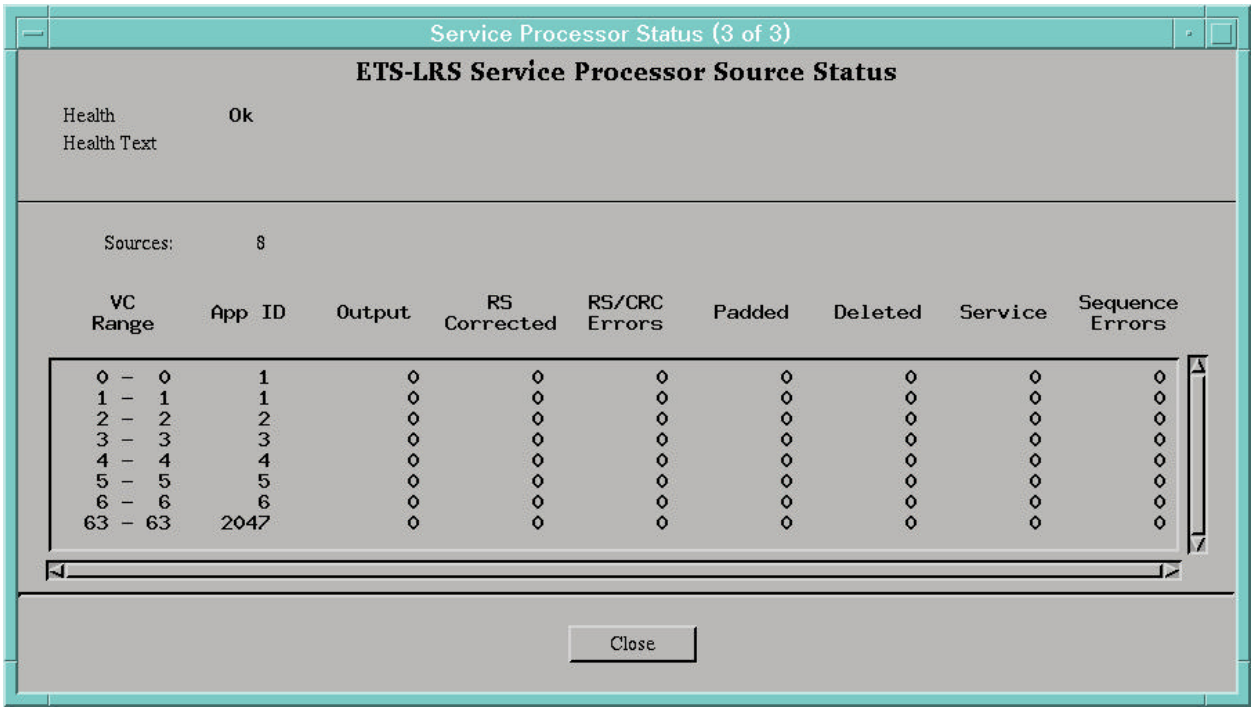
1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on the **Status...** button within the Quick Status display.

The list of subsystems for the selected VLSI system is displayed.

3 Hold the mouse button down, move the mouse cursor over **Service Processor Source Status**, and release the mouse button to display the following window.



8.7 Simulator Card Status

The Simulator Card status window provides detailed information on simulating data.

1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

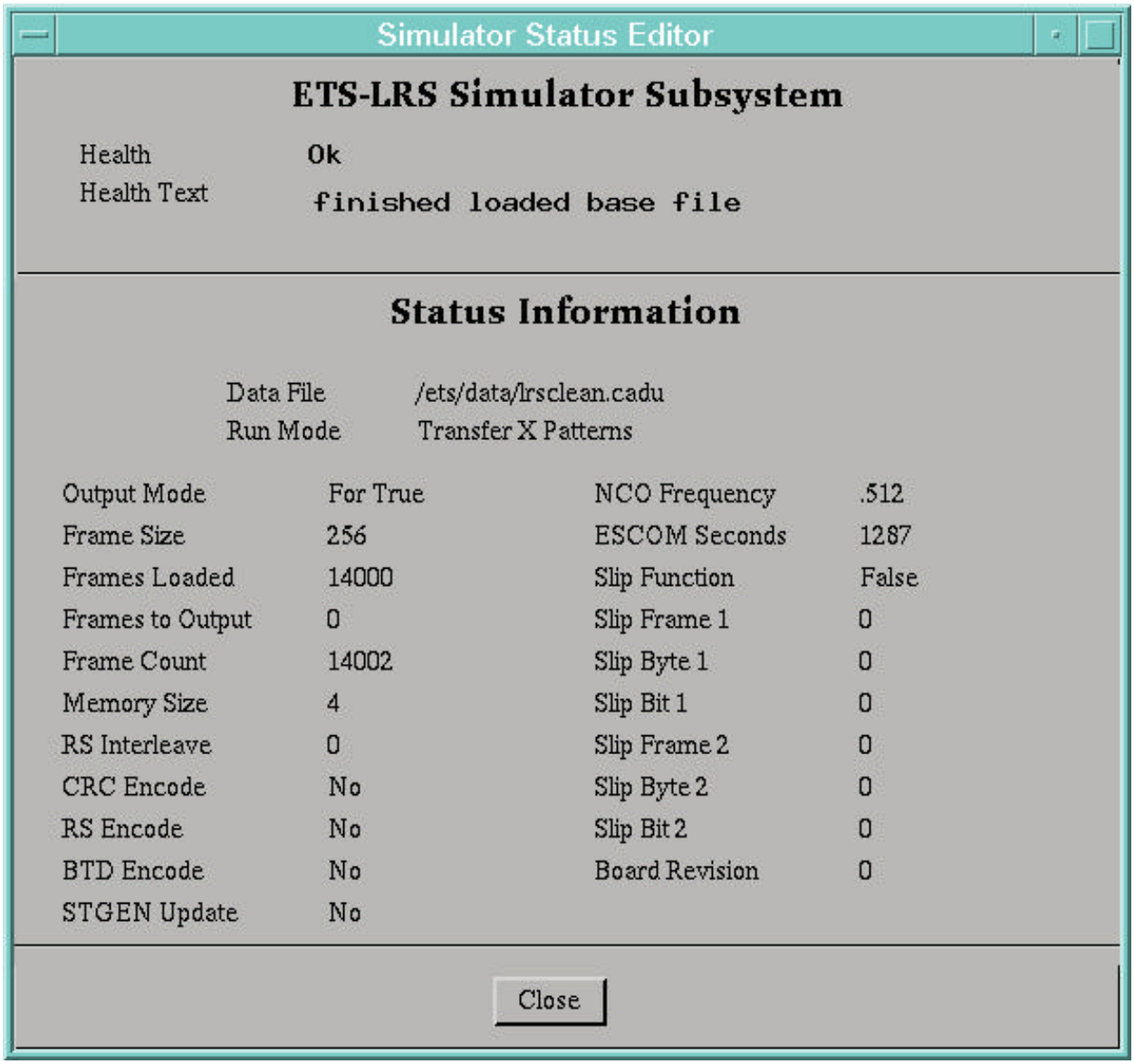
The Quick Status window is displayed.

2 Click on the **Status...** button within the Quick Status display.

The list of subsystems for the selected VLSI system is displayed.

3 Hold the mouse button down, move the mouse cursor over **Simulator Status...**, and release the mouse button.

The Simulator Status Editor window is displayed.



Fields are defined as follows:

Health: status of hardware during operation; may read Ok, Good, Bad, Dead, or Booting.

STATUS INFORMATION:

Data File: name and path of data set file (e.g., /ets/data/lrsclean.cadu).

Run Mode: indicate whether card is generating data or stopping (e.g., transfer X patterns)

Output Mode: indicate whether data is generated in forward, reverse, true, etc.

Frame Size: number of bytes in a frame.

Frame Loaded: number of frames to be loaded per run.

Frame to Output: indicate number of frames output.

Frame Count: number of frames have been generated.

Memory Size: number of available bytes in memory.

RS Interleave: indicate Reed-Solomon interleave level.

CRC Encode: indicate if CRC encoding scheme is used.

RS Encode: indicate if Reed-Solomon encoding scheme is used.

BTD Encode: indicate if bit transition density is selected.

STGEN Update: indicate whether the update function is exercised.

NCO Frequency: indicate clock output frequency (e.g., .512 MHz).

ESCOM Seconds Counter: indicates error occurred.

Slip Function: indicate **FALSE** if no slip function is selected; **TRUE** if either one of two slip functions is selected.

Slip Frame 1: indicate GN if gain is detected; LS if loss bit is detected in Slip No. 1 function.

Slip Byte 1: indicate which byte in frame slip bit is detected in Slip No. 1 function.

Slip Bit 1: indicate 0, 1, 2, or 3 depending on number of bit slip(s) detected.

Slip Frame 2: indicate GN if gain is detected; LS if loss bit is detected in Slip No. 2 function.

Slip Byte 2: indicate which byte in frame slip bit is detected in Slip No. 2 function.

Slip Bit 2: indicate 0, 1, 2, or 3 depending on number of bit slip(s) detected.

Board Revision: indicate hardware revision number of board.

Manual Control of Processing
9

The Manual command menu is used to manually command the VLSI. The window displays the status of the last VLSI command executed, the time-tag for that command, and the resulting processing or execution status.

9.1 Load a Configuration Set

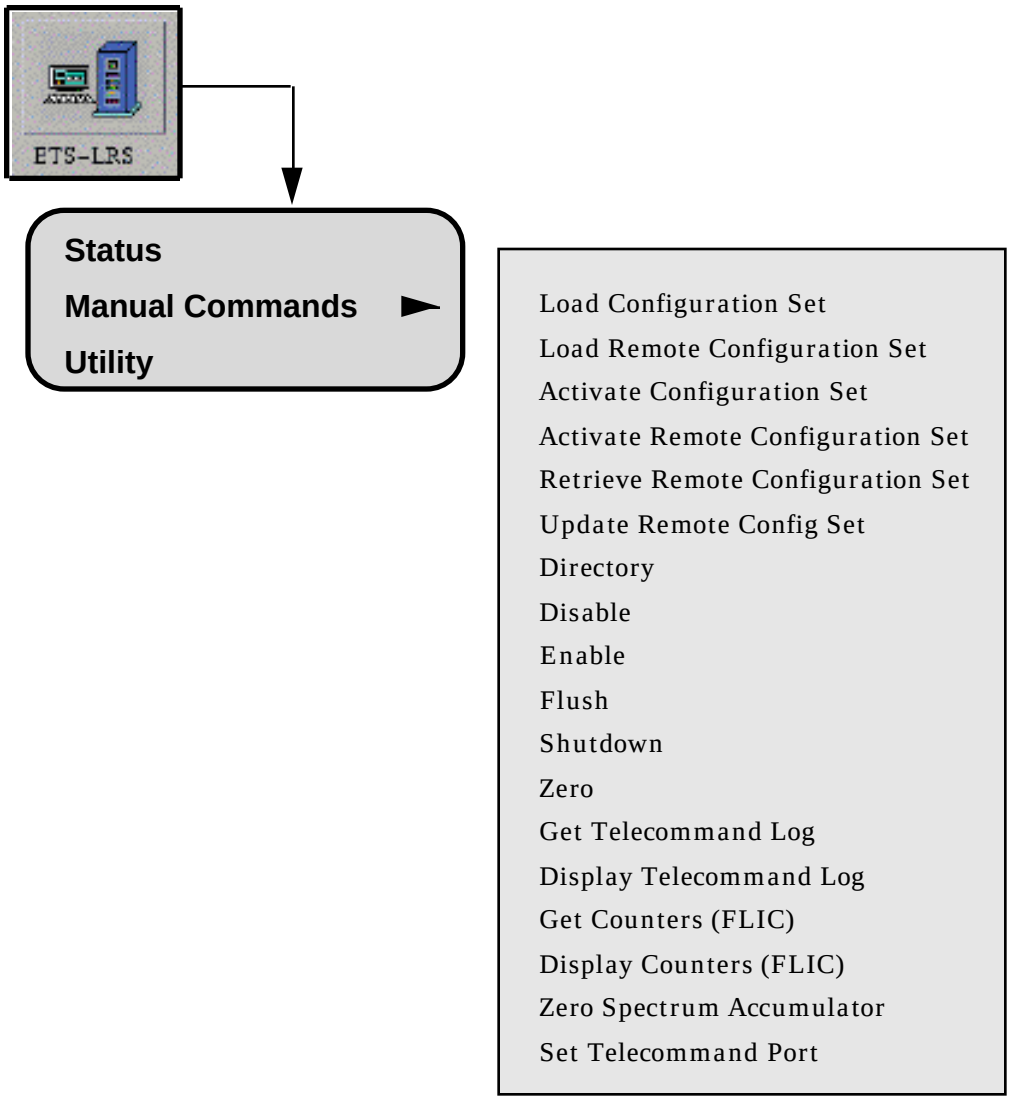
To load telemetry processing parameters stored in a configuration set in the library, use the **Load Configuration Set...** command. This command loads the configuration set, but does not enable VLSI subsystems (refer to Section 9.6, Enable VLSI Subsystems). All status counters are reset to zero when a new configuration set is loaded.

1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on the **Manual Commands...** button within the Quick Status display.

The list of manual commands is displayed.



3 Hold the mouse button down, move the mouse cursor over **Load Configuration Set...**, and release the mouse.

The Load Configuration Set window is displayed.

4 Select the configuration set to be loaded.

5 Click **OK** to load the selected configuration set. The configuration set is loaded; the Load Configuration Set command, time tag, and processing status appear in the Quick Status window.

9.2 Load a Remote Configuration Set

To load telemetry processing parameters stored in a configuration set residing on the VLSI, use the **Load Remote Configuration Set...** command. This command loads the configuration set, but does not enable VLSI subsystems (refer to Section 9.6, Enable VLSI Subsystems). All status counters are reset to zero when a new configuration set is loaded.

1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on the **Manual Commands...** button within the Quick Status display.

The list of manual commands is displayed.

3 Hold the mouse button down, move the mouse cursor over **Load Remote Configuration Set...**, and release the mouse.

The Load Remote Configuration Set window is displayed.

4 Select the remote configuration set to be loaded.

5 Click **OK** to load the selected configuration set. The configuration set is loaded; the Load Remote Configuration Set command, time-tag, and processing status appear in the Quick Status window.

9.3 Activate a Configuration Set

To load telemetry processing parameters stored in a configuration set in the library and enable all VLSI subsystems, use the **Activate Configuration Set...** command. All status counters are reset to zero when a new configuration set is activated.

1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on the **Manual Commands...** button within the Quick Status display.

The list of manual commands displayed.

3 Hold the mouse button down, move the mouse cursor over **Activate Configuration Set...**, and release the mouse.

The Activate Configuration Set window is displayed.

4 Select the configuration set to be activated.

5 Click **OK** to activate the selected configuration set. The configuration set is loaded and the VLSI subsystems are enabled. The Activate Configuration Set command, time tag, and processing status appear in the Quick Status window.

9.4 Activate Remote Configuration Set

To load telemetry processing parameters stored in a configuration set residing on the VLSI and enable all VLSI subsystems, use the **Activate Remote Configuration Set...** command. All status counters are reset to zero when a new configuration set is activated.

1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on the **Manual Commands...** button within the Quick Status display.

The list of manual commands is displayed.

3 Hold the mouse button down, move the mouse cursor over **Activate Remote Configuration Set...**, and release the mouse.

The Activate Remote Configuration Set window is displayed.

4 Select the remote configuration set to be activated.

5 Click **OK** to activate the selected configuration set. The configuration set is loaded and the VLSI subsystems are enabled. The Activate Remote Configuration Set command, time-tag, and processing status appear in the Quick Status window.

9.5 Retrieve Remote Configuration Set

To retrieve telemetry processing parameters stored in a configuration set residing on the VLSI and enable all VLSI subsystems, use the **Retrieve Remote Configuration Set...** command.

1 Click on the desired VLSI-LRS subsystem icon in the **Monitor** window.

The Quick Status window is displayed.

2 Click on the **Manual Commands...** button within the Quick Status display.

The list of manual commands is displayed.

3 Hold the mouse button down, move the mouse cursor over **Retrieve Remote Configuration Set...**, and release the mouse.

The Retrieve Remote Configuration Set window is displayed.

4 Upon completion of retrieval, a list of new catalogs will be displayed on **Retrieve Remote Configuration Set** window.

9.6 Update Remote Configuration Set Directory

To update telemetry processing configuration set residing on the VLSI-LRS, use the **Update Remote Configuration Set Directory** command. All status counters are reset to zero when a new configuration set is activated.

1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on the **Manual Commands...** button within the Quick Status display.

The list of manual commands is displayed.

3 Hold the mouse button down, move the mouse cursor over **Update Remote Configuration Set Directory**, and release the mouse.

4 Upon completion of retrieval, a list of new catalogs will be displayed on **Retrieve Remote Configuration Set** window.

9.7 Directory

To display directory of catalogs, use the **Directory...** command.

1 Click on the desired VLSI-LRS subsystem icon in the **Monitor** window.

The Quick Status window is displayed.

2 Click on the **Manual Commands...** button within the Quick Status display.

The list of manual commands is displayed.

3 Hold the mouse button down, move the mouse cursor over **Directory...,** and release the mouse.

The Directory window is displayed.

9.8 Disable VLSI Subsystems

To disable one or more VLSI subsystems, use the **Disable...** command. No data is processed when subsystems are disabled.

1 Click on the desired VLSI-LRS subsystem icon in the **Monitor** window.

The Quick Status window is displayed.

2 Click on the **Manual Commands...** button within the Quick Status display.

The list of manual commands is displayed.

3 Hold the mouse button down, move the mouse cursor over **Disable...,** and release the mouse.

The Disable window is displayed.

4 Select the subsystems to be disabled.

5 Click **OK** to disable the selected subsystems. The Disable command, time-tag, and processing status appear in the Quick Status window.

9.9 Enable VLSI Subsystems

To enable one or more VLSI subsystems, use the **Enable...** command so that data processing can occur.

1 Click on the desired VLSI-LRS subsystem icon in the **Monitor** window.

The Quick Status window is displayed.

2 Click on the **Manual Commands...** button within the Quick Status display.

The list of manual commands is displayed.

3 Hold the mouse button down, move the mouse cursor over **Enable...**, and release the mouse.

The Enable window is displayed.

4 Select the subsystems to be enabled.

5 Click **OK** to enable the selected subsystems. The Enable command, time-tag, and processing status appear in the Quick Status window.

9.10 Flush VLSI Subsystems

To flush one or more VLSI subsystems, use the **Flush...** command. This command flushes all data currently in process by a subsystem to the next subsystem within the pipeline.

1 Click on the desired VLSI-LRS subsystem icon in the **Monitor** window.

The Quick Status window is displayed.

2 Click on the **Manual Commands...** button within the Quick Status display.

The list of manual commands is displayed.

3 Hold the mouse button down, move the mouse cursor over **Flush...**, and release the mouse.

The Flush window is displayed.

4 Select the subsystems to be flushed.

5 Click **OK** to flush the selected subsystems. The Flush command, time-tag, and processing status appear in the Quick Status window.

9.11 Shut Down VLSI Subsystems

To shut down one or more VLSI subsystems, use the **Shutdown...** command. No data processing is performed when subsystems are shut down. This is equivalent to a Flush command followed by a Disable command.

1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on the **Manual Commands...** button within the Quick Status display.

The list of manual commands is displayed.

3 Hold the mouse button down, move the mouse cursor over **Shutdown...** and release the mouse.

The Shutdown window is displayed.

4 Select the subsystems to be shut down.

5 Click **OK** to shut down the selected subsystems. The Shutdown command, time-tag, and processing status appear in the Quick Status window.

9.12 Zero Status

To zero the status counters for one or more VLSI subsystems, use the **Zero Status...** command.

1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on the **Manual Commands...** button within the Quick Status display.

The list of manual commands is displayed.

3 Hold the mouse button down, move the mouse cursor over **Zero Status...**, and release the mouse.

The Zero window is displayed.

4 Select the subsystems to be zeroed.

5 Click **OK** to zero the status for the selected subsystems. The Zero Status command, time-tag, and processing status appear in the Quick Status window.

9.13 Get Telecommand Log

This command was available for other mission (e.g., ACE). Use the CBP and FLIC status pages instead.

9.14 Display Telecommand Log

This command was available for other mission (e.g., ACE). Use the CBP and FLIC status pages instead.

9.15 Get Counters

This command was available for other mission (e.g., ACE). Use the CBP and FLIC status pages instead.

9.16 Display Counters

This command was available for other mission (e.g., ACE). Use the CBP and FLIC status pages instead.

9.17 Zero Spectrum Accumulator

This command was available for other mission (e.g., ACE). Use the CBP and FLIC status pages instead.

9.18 Set Telecommand Port

To set Telecommand Port.

1 Click on the desired VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on the **Manual Commands...** button within the Quick Status display.

The list of manual commands is displayed.

3 Hold the mouse button down, move the mouse cursor over **Set Telecommand Port ...**, and release the mouse.

4 Select **Data & Clock Enable** to send serial data out. The TEL LED on FLIC front panel should lit.

5 Select **None** to inhibit sending data out. The TEL LED on FLIC fron panel should not lit.

Utility
10

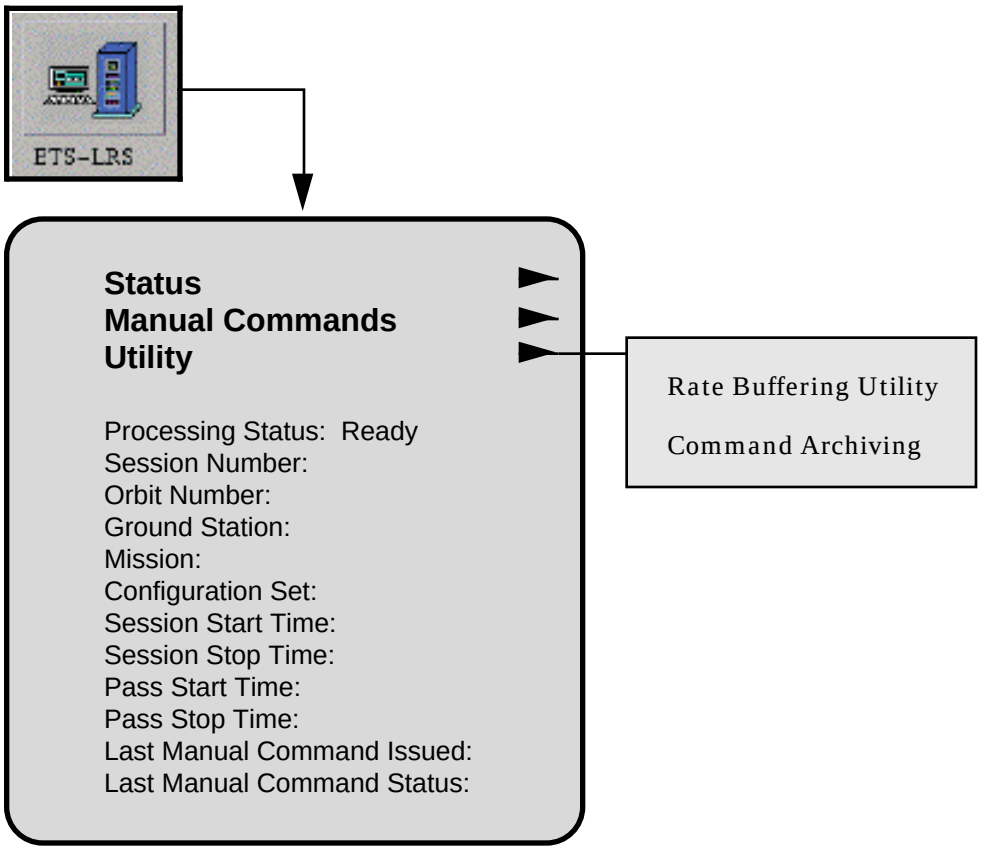
The Utility command menu is used to request information on the processing status of the Rate Buffering and Command Archiving processes. These ETS Low-Rate System utilities are activated as part of TPCE initialization. To view their current status, request their associated displays through the Quick Status window.

1 Click on the VLSI-LRS subsystem icon in the Monitor window.

The Quick Status window is displayed.

2 Click on arrow on the right side of the **Utility...** button within the Quick Status display.

The list of utilities is displayed.



10.1 Rate Buffering Utility

The Rate Buffering Utility window shows the current or rate buffered file name, along with its size and other status.

1 Click on the VLSI-LRS subsystem icon in the Monitor window.

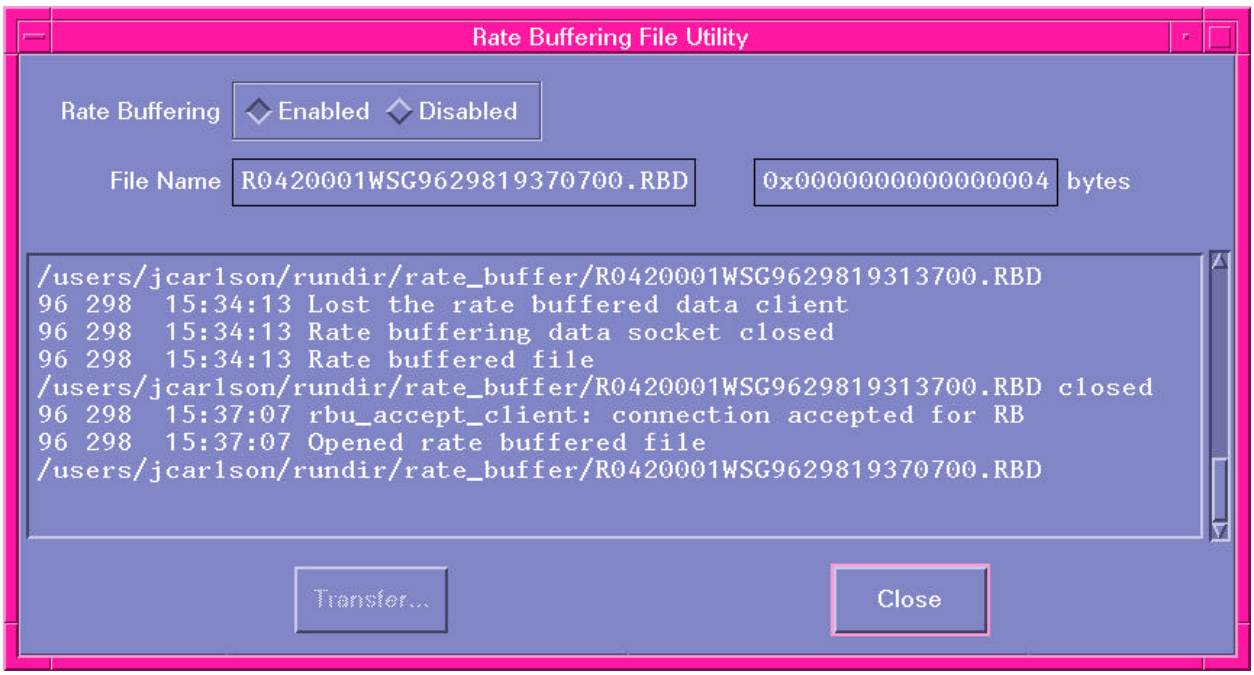
The Quick Status window is displayed.

2 Click on arrow on the right side of the **Utility...** button within the Quick Status display.

The list of utilities is displayed.

3 Click on the **Rate Buffering Utility** button.

The Rate Buffering File Utility window is displayed.



Fields are defined as follows:

Rate Buffering Enabled/Disabled: This is a radio button selection box. When the rate buffering function is enabled, playback data received from the return link VLSI subsystem is written into a file. When this function is disabled, any open rate buffered file is closed and any subsequently received data is discarded. If the function is changed back to enabled, rate buffering will begin again with the next spacecraft contact session. The initial state of this box is determined by the RB_ENABLED_DEFAULT environment variable. See the description of environment variables at the end of this section.

File name: The name of the current or most recently closed rate buffered data file is shown on the screen. The file names are constructed as defined by the **EDOS-EGS ICD**. Several characters in the filename are defined by environment variables, since values such as Ground Station must be simulated by the utility.

Bytes: The total size in bytes of the captured rate buffered data for the current or most recent spacecraft contact session.

Scrolling message region: This general message area provides time-tagged information specific to the rate buffering processing utility. Messages are sent to this scrolling region describing the full path names of the data files as they are opened and closed. Information on the values of environment variables and operator selections are logged here as well as processing error conditions, such as i/o errors.

Environment variables: The following environment variables have been defined for use by the Rate Buffering utility.

RB_APID This variable defines a 7 character string representing the spacecraft identifier and APID of the data. For EOS AM1 rate buffered data, this variable should be set to 0420001. This string is used as part of the rate buffered file name.

RB_DEFAULT_ENABLED This variable should be set to *TRUE* to enable the utility as the default condition. This variable should be set to *FALSE* to disable the utility initially.

RB_DIRECTORY This variable defines the storage location for the generated rate buffered files.

RB_GROUND_STATION This variable defines the ground station that received the rate buffered data. The allowed values for this 3 character field are provided by the *EDOS-EGS ICD*. This string is used as part of the rate buffered file name.

RB_MAXSIZE A maximum file size for rate buffered files can be defined between EDOS and the EOC. This environment variable allows the utility to be configured as needed. This number specifies the maximum file size in Gigabytes with 2 GB being the UNIX file size upper limit.

RB_OMD_PORT This variable defines a socket for communication between this utility and the OMD Simulator. Initially this variable is set at 5010.

RB_PORT This variable should be set to the socket number designated for communication of the rate buffered data between the VLSI and the workstation. Initially this value is set at 5001.

RB_SERVER This variable should be set to the host name of the ETS LRS workstation, which is currently *ets-gsf1*.

NOTE: Currently there is no automatic method of transferring the rate buffered files out of the ETS LRS. Eventually this will be done via Kerberos FTP. For initial testing, FTP may be used from a separate xterm window to transfer files to other systems.

10.2 Command Archiving Utility

The Command Archiving Utility window shows the current command archive file names, file sizes and other status.

1 Click on the VLSI-LRS subsystem icon in the Monitor window.

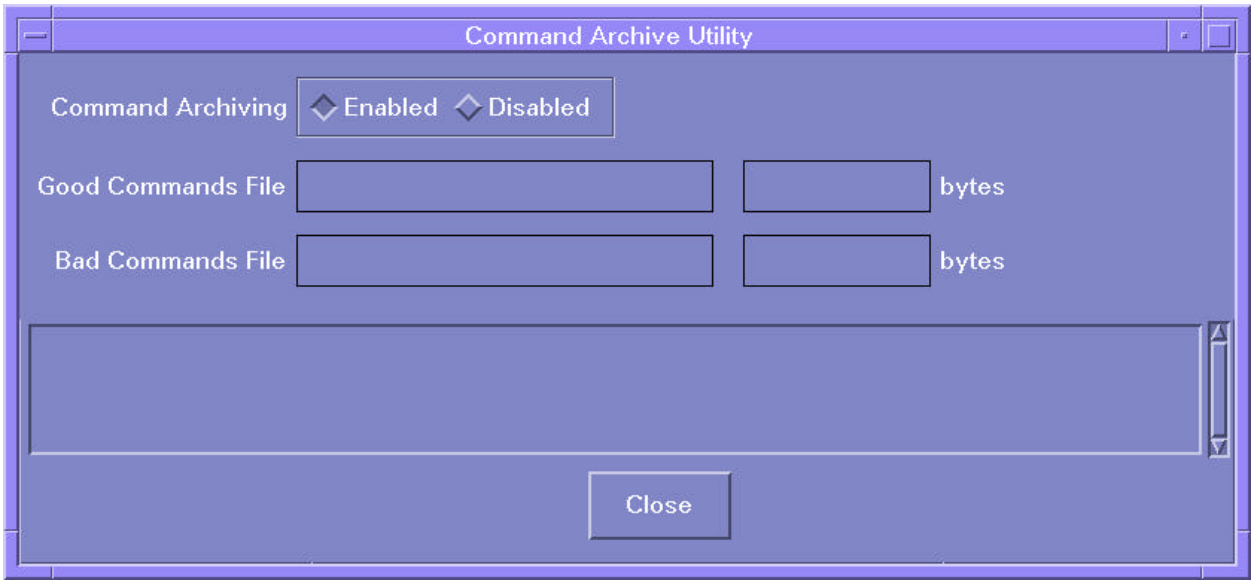
The Quick Status window is displayed.

2 Click on arrow on the right side of the **Utility...** button within the Quick Status display.

The list of utilities is displayed.

3 Click on the **Command Archiving** button.

The Command Archiving window is displayed.



Fields are defined as follows:

Command Archiving Enabled/Disabled: This is a radio button selection box. When the command archiving function is enabled, command blocks received from the Low-Rate VLSI subsystem are written into two archive files. When this function is disabled, any open archive files are closed and any subsequently received commands are discarded. When the function is changed back to enabled, command archiving will resume with new archive files. The initial state of this box is determined by the CA_ENABLED_DEFAULT environment variable. See the description of environment variables at the end of this section.

Good Command File and **Bad Command File:**

The names of the active or most recent command archive files are shown on the screen. There are two files, one for good command blocks and one for bad command blocks. The validity of the command blocks is determined by the VLSI subsystem and sent to the workstation over the good command socket or the bad command socket.

Bytes:

The sizes of the command archive files in bytes are shown.

Scrolling message region:

This general message area provides information on processing activity. Time-tagged messages are sent to this scrolling region describing the full path names of the archive files as they are opened and closed. Logging of operator selections is sent to this area. Information on processing error conditions, such as i/o errors or unexpected loss of socket connections are also sent here.

Environment variables: The following environment variables have been defined for use by the Command Archiving utility.

CA_BAD_PORT This variable should be set to the socket number designated for communication of invalid command blocks between the VLSI and the workstation. Initially this value is set at *3010*.

CA_ENABLED_DEFAULT This variable should be set to *TRUE* to enable the utility as the default condition. This variable should be set to *FALSE* to disable the utility initially.

CA_DIRECTORY This variable defines the storage location for the generated command archive files.

CA_GOOD_PORT This variable should be set to the socket number designated for communication of valid command blocks between the VLSI and the workstation. Initially this value is set at *3015*.

CA_SERVER This variable should be set to the host name of the ETS LRS workstation, which is currently *ets-gsf1*.

System Constraints

11

This section provides useful tips for user to avoid unexpected results.

11.1 Bring Up TPCE

LRS is required to complete a warm boot no longer that 10 minutes. When you exit from TPCE, system is gracefully shutting down all opening processes and network sockets. It is necessary that you **wait for at least 30 seconds** before bring up TPCE again after a graceful shutdown.

11.2 Closing a TPCE Window

To close a TPCE window, the displayed "**Close Button**" on the window must be used. **Do not use** the **pull-down** menu method to close a TPCE window.

11.3 Update Current Date and Time for Activity Schedule

If the current time (indicated by the arrow head) is not in view when you select **Current Time** from the View menu in the **Activity Schedule** window (reference Section 4), it is necessary to update current date and time in the following file.

a. Change to **Schedules** directory by opening up a terminal window and enter a Unix command. For example, if you are running in an environment of test team, enter the following command:

   cd users/combotst/build7/scr/tpce/data/schedules/

b. Use a text editor tool (e.g., vi) to edit the file "**aScratchSchedule**"

c. Modify the first line of this file to reflect current date and time. For example, entering the following format for January 29, 1997 7:30 am

	Year	Day	Hour	Minute	Second
first line of file should read	1997	29	00	00	00

Note: The time shown in the activity scheduler is Greenwich Mean Time (GMT) a world wide standard. There is about a four hour difference between time at the Goddard Space Flight Center (GFSC) and GMT.

d. Save the newly revised information.

11.4 Orbit Number Entry on Activity Schedule

When system detects the **Orbit Number** on the new schedule is smaller than an Orbit Number that is in one of previously saved sessions, it will pop up a window alerting that a conflict has been detected. You can do either one of following procedures:

a. Enter a larger Orbit Number, or

b. Change directory to the following directory by opening up a terminal window and enter a Unix command. If you are running in an environment of test team, enter the following commands:

cd users/combotst/build7/scr/tpce/data/schedules/

cp emptySchedule aScratchSchedule (copy an empty schedule to **aScratchSchedule** file)

Modify the first line of file "**aScratchSchedule**" per steps in section 11.2 to update current date and time.

11.5 Removing Rate-buffered Data Files

It may be necessary to free up the disc space by deleting unused rate-buffered files. Perform the following steps:

a. Change to **Rate_Buffer** archive directory by opening up a terminal window and enter a Unix command. For example, if you are running in an environment of test team, enter the following command:

cd users/combotst/build7/bin/runtime/rate_buffer

b. Enter the following command to list all files in this directory with information on file size and date that file was created.

ls -l

c. Remove unused files by enter the following command:

rm "filename" (for example rm R0420001WSG9703019170800.RBD)

11.6 Removing Command Data Files

It may be necessary to free up the disc space by deleting unused command data files. Perform the following steps:

a. Change to **Command Archive** directory by opening up a terminal window and enter a Unix command. For example, if you are running in an environment of test team, enter the following command:

cd users/combotst/build7/bin/runtime/cmd_archive

b. Enter the following command to list all files in this directory with information on file size and date that file was created.

ls -l

c. Remove unused files by enter the following command:

rm "filename" (for example rm CAU_97017180010.BAD_CMD)

11.7 Configuration Setup for Forward Link Scenario

When configuring Command Data Block processing, be sure to use correct entries. Inappropriate settings will result in following error message **"ERROR: MALLOC ERROR 3301 Exiting"**. Perform the following steps:

1. Select **New...** from the File menu in the **Configuration Set Editor** window.

   A listing of the available configuration sets is displayed.

2. Highlight the Command Block Processor subsystem to show the associated parameters for configuring CBP.

3. Double click on a parameter, a subwindow is displayed. Enter appropriate value(s) associated with that parameter, as follow.

Command Data Block Length: 16384 (entry should be between 16384 and 65536**)**

Number of Command Data Blocks: 20 (entry should be between 20 and 80**)**

ACRONYMS AND ABBREVIATIONS

Term	Definition
AOS	Advanced Orbiting Systems
APID	Application Process Identifier
CADU	Channel Access Data Unit
CCB	Configuration Control Board
CCSDS	Consultative Committee for Space Data Systems
CDS	Control and Display Subsystem
CLTU	Command Link Transmission Unit
CPU	Central Processing Unit
CRC	Cyclical Redundancy Check
DCN	Documentation Change Notice
DMA	Direct Memory Access
DRAM	Dynamic Random Access Memory
EOC	EOS Operation Center
EOS	Earth Observing System
EOSDIS	EOS Data and Information System
ETS	EOSDIS Test System
FEP	Front-end Processor
FLIC	Forward Link Interface Card
GMH	Ground Management Header
GSFC	Goddard Space Flight Center
GVCID	Global Virtual Channel Identifier
HRTB	High-rate Telemetry Backplane
I/O	Input/Output
LED	Light-emitting Diode
LRS	Low-rate System
MCC	Master Controller Card
MEDS	Modular Environment for Data Systems
Nascom	NASA Communications
NCO	Numerically Controlled Oscillator
OPMAN	Operations Manager
SCID	Spacecraft Identifier
SCSI	Small Computer System Interface
SMA	Subminiature Assembly
SRAM	Static Random Access Memory
TCP/IP	Transmission Control Protocol/Internet Protocol
TCPE	Telemetry Processing Control Environment
VCA	Virtual Channel Access
VCDU	Virtual Channel Data Unit
VCID	Virtual Channel Identifier
VME	Versa Module Eurocard
VSB	VME Subsystem Bus